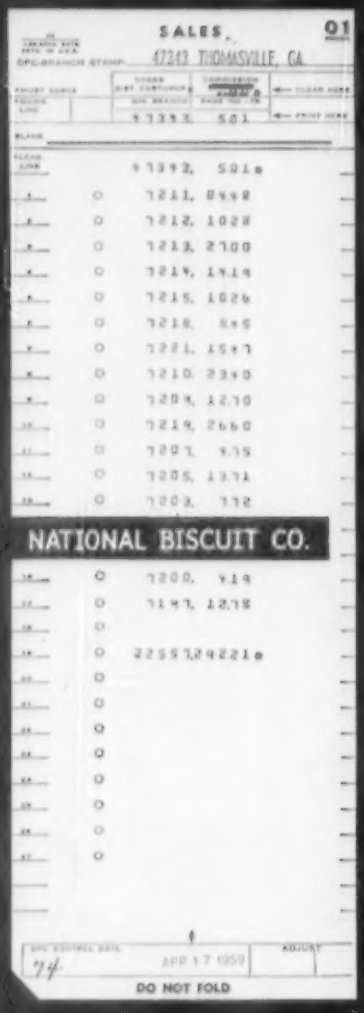
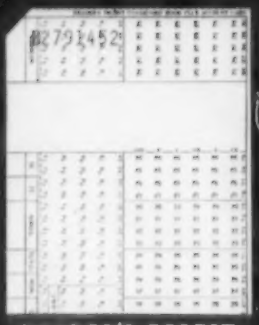
December 1959

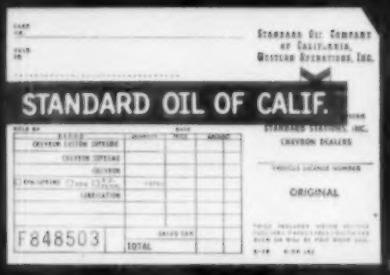
MANAGEMENT *and* BUSINESS AUTOMATION

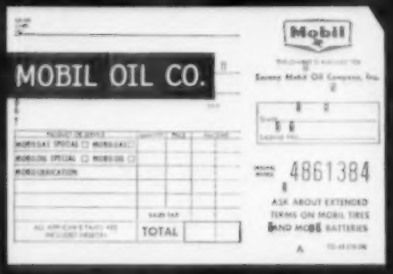
The Problems of Data Processing

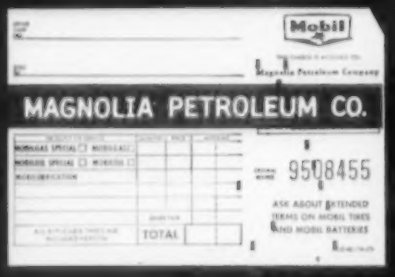
Page 8

FARRINGTON OPTICAL SCANNERS ARE NOW AT WORK FOR:









These seven companies—and many more—discovered that the Farrington Optical Scanner (known as the EYE) could revolutionize their data processing and billing operation.

The EYE is the only machine that actually "reads" imprinted data just as the human eye does. It then translates what it has read into punched cards or tape, the language understood by automatic sorters and computers . . . with a speed, accuracy and economy that no human eye and hand can duplicate. From 75,000 to 150,000 cards are processed per day. Tape is even faster.

Optical scanning is the most flexible means of translating printed data into any form for processing. Because the EYE sees its data, there is no need for special inks or papers. The Farrington Optical Scanner can read almost any type face, any character—alphabetical or numerical—and can also be programmed to read symbols.

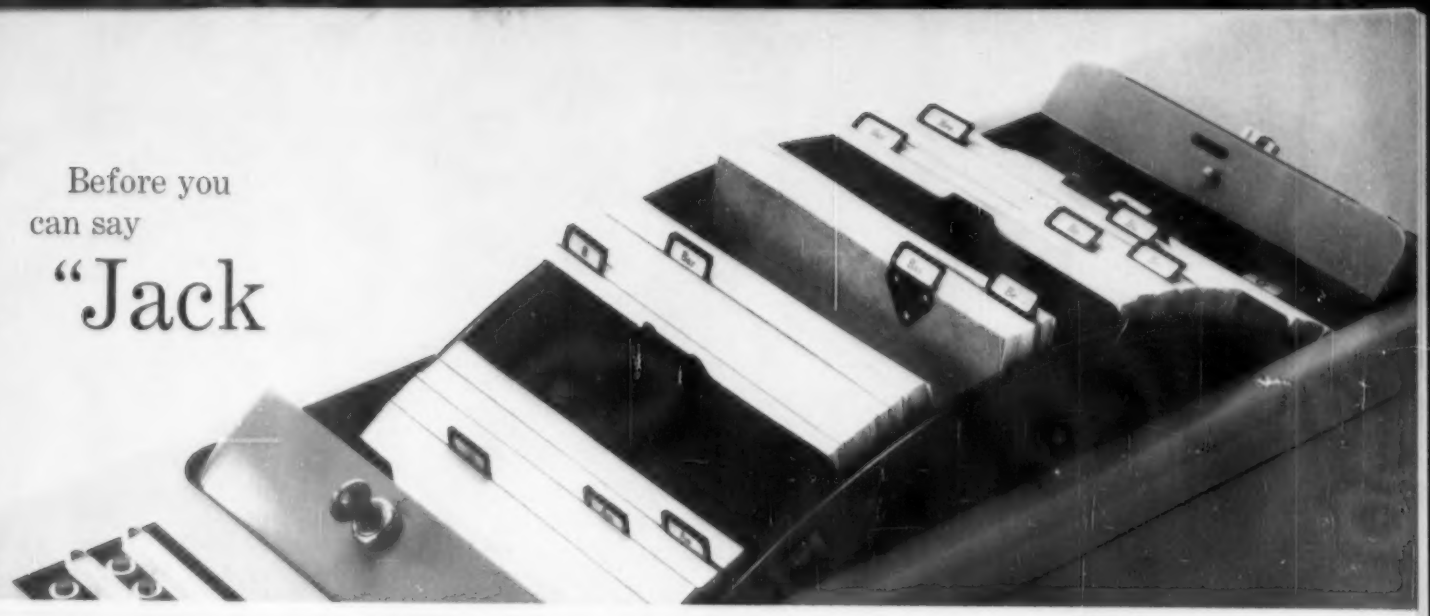
If you have three or more operators who read and punch, you can probably use an Optical Scanner to advantage. Only Farrington makes it.

For further information, write the Farrington Manufacturing Company, Needham Heights 94, Mass.

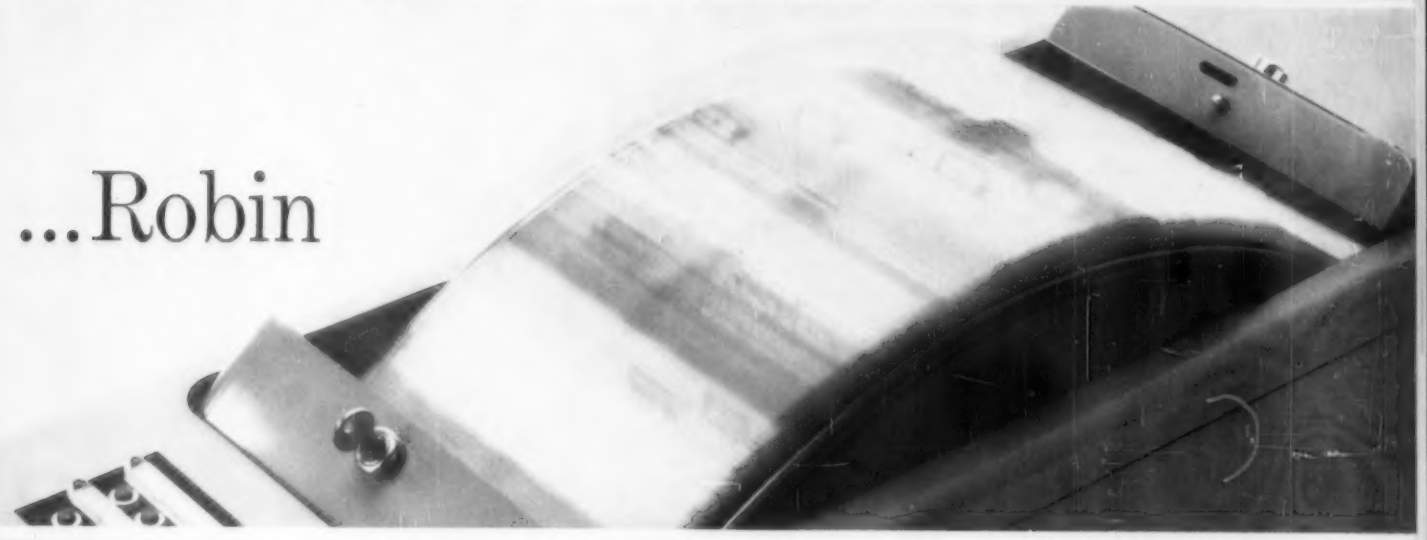
FARRINGTON®

For More Information Circle Reader Service Card No. 12-53

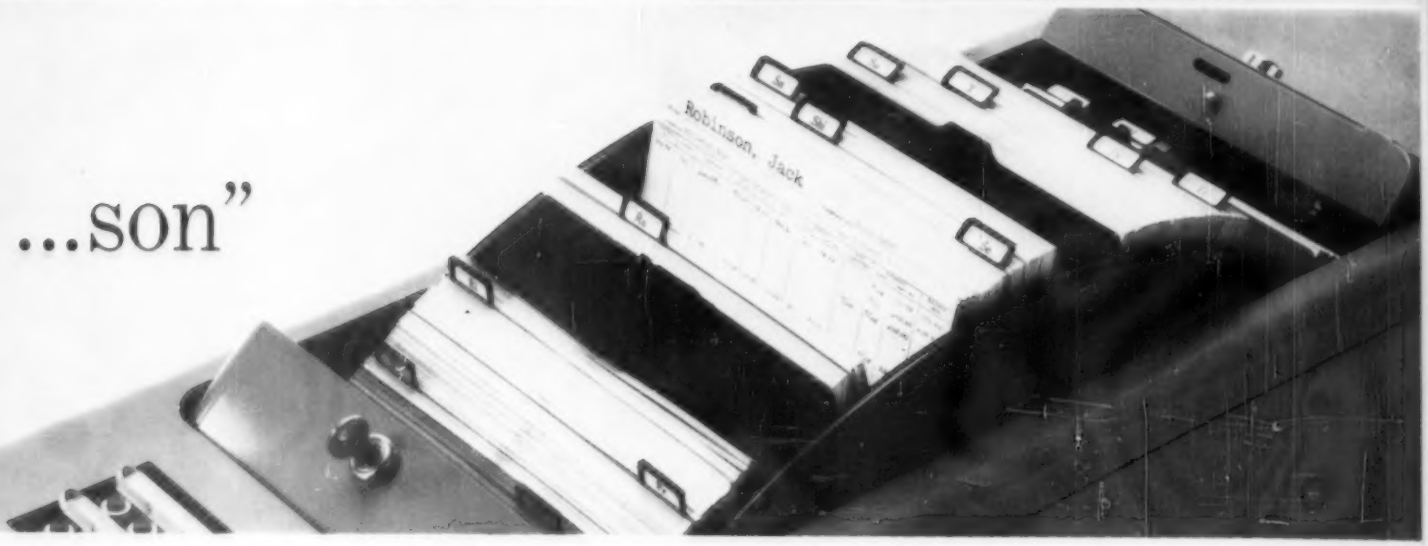
Before you
can say
"Jack



...Robin



...son"



...you've got his card. Or an inventory card, data card, account receivable. *Any* type of card-record. That's provided they're in a REVO-FILE, Mosler's amazing new rotary file. It's entirely different from old style tray files or rotaries in capacity, mobility, and ease of finding and filing. Just *drop* your cards in REVO-FILE... use the coupon, today! **Mosler Revo-File Systems Division.**

For More Information Circle Reader Service Card No. 12-59

Dept. **MB-1259**, Revo-File Division,
The Mosler Safe Co.,
320 Fifth Ave., New York 1, N. Y.
Send me information on **MOSLER REVO-FILE**

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

MANAGEMENT *and* BUSINESS AUTOMATION

December, 1959
Vol. 2, No. 6

New ideas, developments, applications, results, and the human impact of business automation in commerce, industry and government.

8 Pinpointing the Problems Of Data Processing

Six authorities examine the major problems of data processing at the first MBA Roundtable, held in Washington, D.C.

15 Paper Tape Simplifies Revenue Control

A Michigan trucking firm gets its reports as a by-product of posting customers' accounts receivable.

16 Internal Recruitment—A Program For Selecting Data Processing Personnel

By Deborah Blumer

Professional testing can reveal that a company already employs personnel qualified to staff an EDP installation.

20 Selective Addressing by Tab Cards

The publishing house of P. F. Collier & Son has automated its label and invoice production.

23 'Project Turnkey'—Push-button Post Office of Tomorrow

30 Magnetic Mail System Speeds Data Handling

5 Letters
6 Random Access
7 Publisher's Column
38 MBA Showcase
42 News
45 MBA Calendar
45 Advertisers' Index
46 Editorial

Publisher
John A. Gilbert

Executive Publisher
Charles W. Gilbert

Editor
Arnold E. Keller

Editorial Director
Arthur Gould

Editorial Coordinator
W. S. Lennartson

Associate Editor
Robert Minor

Contributing Editor
Eugene Whitmore

Production Manager
Robert J. Skup

Circulation Director
Stanley Roy

Assistant Circulation Manager
Hugh D. McCahey

Treasurer
R. M. Daugherty

EDITORIAL OFFICES and ADVERTISING OFFICES:
600 W. Jackson Blvd.
Chicago 6, Illinois
DEarborn 2-3206

ADVERTISING OFFICES:
100 E. 42nd St.
New York, N.Y.
MUrray Hill 2-3373

3275 Wilshire Blvd.
Los Angeles 5, Calif.
DUnkirk 2-7337

MANAGEMENT and BUSINESS AUTOMATION is published monthly and © copyrighted 1959 by The Office Appliance Co., 600 W. Jackson Boulevard, Chicago 6, Illinois. Accepted as controlled circulation publication at Chicago and Mt. Morris, Illinois.

Subscription Rates: United States, one year, $5; two years, $8. Canada, Pan American and foreign, one year, $12; two years, $20. Single copies: U.S.—75c; all other countries—$1.50.

Change of Address: Send new and old addresses (preferably with an MBA label), including postal zone numbers, to Circulation Department, MANAGEMENT and BUSINESS AUTOMATION.
Receipt of changes by the 10th of the month will assure correct addressing of next issue.

Postmaster: Send notices to MANAGEMENT and BUSINESS AUTOMATION, 600 W. Jackson Boulevard, Chicago 6, Illinois.

Letters

Dear Sir:

Your October editorial entitled "Why Overlook the Systems Man?" is of considerable interest. I echo your question, why, indeed? but, I add the proviso that we need to recognize that the term "systems man" is used to cover a multitude of "unidentifiable" people.

More frequently than not, the so-called professional systems man is nothing more than a glorified "forms design expert"; frequently, he had little or no experience of complex data processing equipment; frequently, he has little installation experience; quite often he also fails to realize that systems work is a part of the natural content of any good line operation although it may not carry the name of "systems."

I thoroughly agree with your remarks concerning management consultants; so many of them are "phonies." We see many reputable companies advertise for systems specialists 32 to 35 years of age and calling for experience that no man of this age could possibly have had. Quite frequently consultants put systems men into the field who are untrained for the work. They turn out to be the blind trying to lead the blind.

The profile of the systems engineer is a complex one. Systems men may be found in many parts of a company and usually they are men with ideas.

The blunders committed in the use of data processing equipment have been due largely to the so-called specialists, i.e., consultants, systems men, accountants, etc. The run-of-the-mill systems man usually fails to recognize that the systems area properly is concerned with the information network of a company and the arrangements necessary to create, install, and maintain such a network.

When the systems man could have done some useful work in this direction on an educational basis he was fiddling around with forms design, work simplification, and a whole host of "techniques"; and, for that matter, in the majority of cases still is.

The usual systems man, unable to see systems work in concept form, develops his so-called profession around a ramshackle bundle of what may be temporary techniques. He is, therefore, hardly a fitting person to lead management men. We have had the opportunity of observing systems men (and, by the way, I have been one) and we would venture to say that of those companies we have been associated with only one in fifty can do anything other than extremely mundane run-of-the-mill work.

P. S. This criticism of the systems man is not intended to be destructive. But, until the systems professionals see their work against a broader background, they are only likely to fritter around on the edge of things.

Lionel E. Griffith
Assistant Controller
International Latex Corporation
Dover, Delaware

"Here's how our Embee folder paid for itself!"

Meet Mrs. Goldena Robinson, office supervisor of the duplicating department at American Telephone and Telegraph Company's Long Lines Department, in Kansas City, Mo. A year and a half ago, AT&T installed a model 360 Davidson Embee Folder, and since then, says Mrs. Robinson, "We have found several major uses for our machines. We use it to fold sketches of circuit layouts of telephone installations, and circuit order work sheets, as well as for other folding jobs. It's been our experience that the Embee can fold sheets six times as fast as methods formerly used. In addition, the end result is much neater folds . . . there's never any doubt that the folded sheet will fit properly in the envelope. We feel that in labor savings alone the Embee folder has paid for itself . . . and that's without taking into consideration the great convenience that owning this machine provides!"

There are two Embee models, both attractively priced. Embee Folders, with simple attachments, can slit, perforate and score, as well as fold at speeds up to 12,000 sheets an hour! If you'd like to know more about the very special savings you get with an Embee, plus interesting news about our free trial, call your local Davidson Distributor or write today to DAVIDSON CORPORATION, *subsidiary of Mergenthaler Linotype Company*, 29 Ryerson Street, Brooklyn 5, New York.

For More Information Circle Reader Service Card No. 55

finding and filing
takes just
Seconds

with BARKLEY TAB GUIDES

Modern offices use Barkley Tab File Guides because they make the job so easy. How? Well, each tab is both angled and magnified—takes only a glance to find the file you want. And Barkley Tabs are durable—stand up under constant use for years. The next time you make up your supply list . . . *be sure to add Barkley Tab File Guides . . . at the top.*

At all leading stationers.

C. L. BARKLEY & CO.

1220 W. VAN BUREN ST. · CHICAGO 7, ILL.

Circle Reader Service Card No. 12-56

CANCER'S DANGER SIGNALS CAN BE SAFETY SIGNALS

You can do two things to guard yourself against cancer: Have an annual health checkup. Alert yourself to the seven danger signals that could mean cancer: 1. Unusual bleeding or discharge. 2. A lump or thickening in the breast or elsewhere. 3. A sore that does not heal. 4. Change in bowel or bladder habits. 5. Hoarseness or cough. 6. Indigestion or difficulty in swallowing. 7. Change in a wart or mole. If your signal lasts longer than two weeks, go to your physician. Give him the chance to give you the chance of a lifetime.

AMERICAN CANCER SOCIETY

RANDOM ACCESS

Information bits from the editor's memory file

Over nine million clerks are needed to handle the nation's paper work, and their ranks grow year by year, says Stanley C. Allen, National Cash Register board chairman. According to Mr. Allen, some 200,000 clerks were added to the rolls last year despite the fact that more than $2 billion was spent on labor-saving office devices. Latest statistics indicate that about one out of six employes in the nation are part of the clerical army, and their ranks already outnumber farm workers.

★

Automatshion?

A Datatron 205 computer is being imported by the Winemakers Association of France to maintain a current census of vineyards. There is said to be a a long list of applicants for the sobering task of installing the system.

"Most Potent Weapon"

Electronic data processing is our most potent weapon for truly effective industrial long-range planning, according to John L. Burns, president of Radio Corp. of America.

In an address to a Leadership Training Conference of the Austin, Tex., Chamber of Commerce, Mr. Burns said that electronic "brains" can soon become a major factor in keeping the national economy on a steady course.

The widespread use of electronic data processing systems, perhaps by 1965, can help reduce to an absolute minimum fluctuations in the economy, he said.

He strongly urged consideration be given to setting up a fourth branch of the Federal Government to concentrate on long-range planning.

Program for Cheese

Computer experts at Monsanto Chemical Co. have revealed that smoother texture and more evenly-melting cheese is being produced with the help of a computer. Value opinions of taste, appearance, melting speed and other qualities of cheese are assigned, and the computer correlates the varied judgments, offering a formula palatable to most persons.

Down, But Not Out

Taxpayers in Dade County, Fla., almost had the thrill of a 90 percent cut in personal property taxes, thanks to a slight error in programming the tax assessor's computer.

The machine dropped a zero while figuring 80,000 tax bills, cutting the assessments from $342,522,630 down to $34,-252,263.

The short-lived reduction was caught before the bills were mailed, and the machine put back to work on a new set of computations. The bill for $200 worth of erroneous tax bills will be paid for—of course—by the taxpayer.

Honorable Univac

The Onoda Cement Co. of Tokyo uses a Univac File Computer to link its main office with the concern's seventy-two branches throughout the country. The machine spells out data in katakana, the simplified Japanese phonetic system, but soon will have an additional command of 2,400 complex kanji, or Chinese ideograph. That is 500 characters more that are needed to read a Japanese newspaper. Onoda rents the computer for $25,000 a month, considered an insignificant sum in the budget of the firm, which does an annual business reported to be exceeded by only three United States cement manufacturers.

from the

Publisher's Desk

One of the things readers seem to like most about MBA is the frequent appearance of the unusual . . . the editorial change of pace. Perhaps the dynamic nature of the business automation revolution demands that something new and different be in the spotlight. At any rate, this is what our editors plan for you as part of your regular reading diet.

For we believe in what might be called 'three-dimensional editing'. Every publication should be edited to cover a wide range of subjects in its field, and to cover each of these subjects thoroughly. These might be called the first two dimensions of editing, *breadth* and *depth*. They are easy to spot in a publication by even a casual reader.

In its first 12 issues MBA has covered the gamut of business automation coverage—case histories on a variety of types of business, background stories on major breakthroughs in paper-handling and electronic communications, controversial articles on unsolved problems of the field, basic research on job standards and salaries, and warnings on the labor-union situation. This, and much more, has established the 'breadth' of our coverage.

'Depth' of our reporting has been commented upon by many readers. The detailed analysis of successful systems applications, the thorough research behind the round-up articles and statistical reports, and the elaborate charting and diagramming have brought to you a type of editorial presentation found nowhere else among the many publications that carry some reference to automation and data processing.

But we feel that a truly adequate publication should have a third dimension . . . perhaps it can be called '*height*'. This is the quality or the ability of a magazine that inspires its readers. It is the appeal that makes them strive for better quality in their work, better standards in their performance, better ethics in their conduct.

Typical of the projects designed to achieve this vital dimension in editing is the round-table on data processing problems moderated by Arnold Keller during the OEME show in Washington. Some of the conclusions reached in this seminar-type of discussion will be found in the report beginning on page 8. If heeded, they could improve the state of the profession tremendously.

Editorial height is difficult to measure. It usually must be sensed. We hope you will feel inspired and challenged by some of the projects our editors will unfold in the months ahead. It is this third dimension that is basic to all of our editorial plans.

Charles W. Gilbert

MBA REPRINTS

The following are available at 25¢ each:

2—**Automating Is a Job For Top Management.** The story of Carborundum's "total systems" concept by General Clinton F. Robinson, president of the Carborundum Co.

3—**A Complete Automation System Delivers the Goods.** How a complete automation system enabled the Yale Transport Co. to reduce the time of delivery from two to three day service (and longer) provided by most carriers—to an overnight service.

8—**Carte Blanche—the Automated Credit Card.** The automation story behind the new giant of the credit card world—Hilton's Carte Blanche.

9—**EMC . . . A New Way Out of Inventory Problems.** How one of the nation's largest department stores successfully pioneered the installation of Electronic Merchandise Control, a system designed to provide an accurate daily record of the movement of goods.

■

The following are available at 50¢ each:

4—**Westinghouse Automates Engineering Drawings.** A complete description of Westinghouse's use of microfilm in punched aperture cards for the filing and reproducing of engineering drawings.

5—**Major Breakthrough in Paper Processing.** The story of MICR (Magnetic Ink Character Recognition)—how it developed, its impact on the banking field, and a review of some of the equipment available.

6—**Magnetic Tape Pays A.T.&T. Dividends.** One of the largest conversions to business automation ever undertaken by private enterprise—the records of American Telephone and Telegraph Co.'s 1,600,000 shareholders—described in depth.

7—**Magnetic Ink Goes to Work.** The story of a bold leap from non automation to a new concept in data processing systems, using magnetic ink character recognition. (Case history of the Merchandise National Bank's installation).

Circle the number of the reprint and enclose this coupon with the exact amount in coins, stamps or check.

MANAGEMENT and BUSINESS AUTOMATION
600 W. Jackson Blvd., Chicago 6, Illinois

Enclosed please find $ ..... to cover the cost of the booklets circled below:

2 3 4 5 6 7 8 9

Name .....

Position .....

Firm .....

Address .....

City ..... Zone ..... State .....

☐ **Check here for quantity prices on items circled**

Washington Roundtable

Pinpointing the Problems Of Data Processing

Experts agree that the major problem involves people; better training for those at the operating level; and more active participation from those at the top management level.

PEOPLE—at both the operating and top management level—represent the biggest problem of data processing. This was the unanimous opinion emphasized by a group of business automation specialists brought together by MANAGEMENT AND BUSINESS AUTOMATION for a round-table discussion on the problems of data processing.

The meeting, first of a series designed to cover all phases of automation in the business world, was held in the Caucus Room of the Hotel Statler, Washington, D.C., and coincided with the inaugural business show sponsored by Office Equipment Manufacturers Exposition, Inc.

The panel of experts was selected right from the automation "firing line" of American business and government—men with broad "know how" experience in actual design, installation, and operation of data processing systems both large and small.

Participating were:

E. D. Dwyer, chief of the Navy Management Office, and the man responsible for the world-wide data processing operations of the Navy Department;

Fred C. Klein, director of customer services planning, Capital Airlines, whose department is charged with the operation of the newly installed Univac Airline Reservation System, first of its kind in the transportation industry;

John W. Haslett, manager, methods and procedures, for one of the nation's largest data processing equipment users, the Shell Oil Co.;

Robert F. Springer, assistant vice president, Government Employees Insurance Co., director of the company's computer program;

V. P. Morgan, assistant manager, Methods, Research and Procedures Dept., Baltimore and Ohio Railroad, instrumental in development of the road's Datamatic 1000 computer installation;

William J. Burke, CPA and resident partner of Ring, Mahony and Arner, a firm of certified public accountants, who operate a unique service bureau for their clients, centered around a Royal McBee LGP 30 small scale computer.

Completing the panel was MBA's editor, Arnold E. Keller, who served as moderator.

The discussion opened with the moderator reviewing the two most common complaints of management in regards to data processing—(1) that promised savings fail to materialize, and (2) that

". . . while we might thank the controller for finally becoming interested and trying to improve his methods of accounting . . . I don't think we have too much to thank him for as far as automating management information systems."

installations do not perform up to expectation. With these two general thoughts before the panel, the round-table discussion got underway.

MR. KLEIN: I think that in our experience the prime problem is the "people" phase. By that I mean, the reluctance on the part of people regarding something new. They just seem to be so allergic to change. The big problem here, of course, is educating these people.

Don't pass the problem

MR. BURKE: I'd better preface this by saying that we are in the very lowest end of the spectrum in the use of computers. We are a CPA firm bringing this service to the very smallest businesses. Our clients have had, on the average, less than 100 employes.

This size precludes the use by those businesses of the machines themselves, and we're using ours as a service center approach. These people historically have been told that they're below the potential of computer users, and they have no conception of what the machine will do or how they should use it.

They haven't even made a study of the type of financial reports and statistical information they should get. This is basically a management education problem.

You can't pass this problem to the machines, salesmen, or outsiders, CPA or anybody else. Management has to accept it. At this level it's not even a university problem, though it is a problem of the future in universities. The people who are going to be using this equipment are already out of school.

I can't speak for large companies, but even on a small level where we as a CPA have been intimate with their problems in the past, we cannot do a good job for management by coming in and suggesting the form and design of the various statistical reporting jobs that they should get. They will have to take that job on themselves, because they know, or should know, what they need.

MR. SPRINGER: I don't believe that there is any one problem that can be classified as most important. Any company embarking on a data processing program has many, many areas that have to be considered, and when these areas aren't considered properly they become serious problems.

Of course, many times after considering particular areas and identifying problems, the solution may be hard to come by. These problems will vary from company to company, based on their own peculiarities of operation.

I definitely agree with Mr. Klein and Mr. Burke that personnel is one of the biggest problems, and the problem of management can also be serious. As someone once said, you cannot delegate responsibility. This is something that management many times tries to do in this area, and it just won't work.

Ingredients for success

I think there are very few ingredients necessary for a successful data processing system. One is top management's acceptance of the responsibility for the program. The second is the delegation—with proper authority and control to the most qualified person in the organization—of the job of heading up the program.

The third is top management's willingness to foot the bill for nothing but the best in staffing the group with systems and programming personnel, and the fourth is proper recognition by the study group that the day to day operations must not suffer as a result of the long range program.

MR. MORGAN: I think the biggest problem has been the need for trained personnel.

When you get one of these giant computers, you can't expect that you'll have anybody who's trained to use it. It's a normal, natural lack. But, the training of people at all levels, or the indoctrination, if you care to call it that, I think is perhaps the biggest problem we have to overcome.

Specifically, of course, the question of training systems people and programmers is more difficult than the indoctrination or the education of management.

A seven-year plan

MR. HASLETT: The most significant problem at Shell was, and still is, planning. We started planning about seven years ago. We are still planning, despite the fact that we have accomplished all of our major objectives originally set forth. The problem of planning, of course, involves embuing all management with the concept of data processing.

It also involves getting everybody directly concerned into the planning stage as well as the doing stage. The components preparatory to any accomplishment at all, as we all know, are most numerous.

We need such things as a uniform accounting system and uniform operating coding. We must analyze existing clerical and accounting adminis-

"We are fortunate in having a separate data processing department that reports directly to the executive office. In addition, we are extremely fortunate in having a president who understands the economics of data processing."

trative systems and improve them before we can plan a program.

At that point the economics can be somewhat more precisely developed. When planning there is also the phasing of what you're going to do and when, and finally the carrying out of the program —involving equipment and space, and most of all, people.

The follow-up and appraisal of results complete the first cycle of the planning, to my way of thinking, and once you've reached that point, accomplishing all these things, then you start all over again. To me, it's a spiral, an unending problem of planning for automation.

Not one, but twelve

MR. DWYER: There isn't any single problem. We recently inventoried the various problems, trying to group them all under a total inventory, and we came up with 12.

I think I'll just go down through the 12. It may give us a better perspective to start from. Most of these are problems that have been rehashed before, but I don't think there is any single one, really, that is any more significant than the others.

(Mr. Dwyer then presented the 12 problems with a further emphasis and explanation for each of the 12, a summary of which follows: 1. Input and output speeds of equipment are not balanced to internal speeds; 2. "Memory" capacities are insufficient and stored information not readily accessible; 3. Details of programming are length, tedious and costly, making it difficult to retain qualified personnel, who soon become bored with the monotonous—but important—routine; 4. Environmental requirements are too stringent because of oversensitive equipment. This runs up costs of site preparation; 5. Preparation of input is still too tedious and costly due to the obsolete manual systems for converting data; 6. Computer systems are still too costly, which sometimes creates an "ethical" problem, whereby the salesman understates the ultimate equipment needs in order to obtain the signed contract; 7. The two extremes of computers—either too general-purpose or too special-purpose; 8. Communications are inadequate, particularly the limitations on the instruction tapes and such, for communicating with the equipment; 9. Top management's failure to understand the capabilities of a computer; 10. There is a need for new concepts in training managers for today's business office; 11. Information systems need a complete reorganization when a system is mechanized; 12. Management expects all information to be handled by data processing and overlooks other, more economical and efficient methods.)

MODERATOR KELLER: I've noticed repeated ref-

"We think that divorcement of the long range job of getting the work on the equipment, from the actual operating responsibility, is basic organization. In both cases, I quite agree, there should be an administrator rather than a technician."

"We have no intention of making our computer a digestive system. We are not going to use it to gobble large quantities of data and do the work that could be done in any other way."

erences to management's role in data processing. This brings to mind some thoughts expressed in two recent articles in MANAGEMENT AND BUSINESS AUTOMATION. General Clinton Robinson, the president of the Carborundum Co., in his piece on "Automating Is a Job for Top Management" (MBA, Feb. 1959 issue) stressed the danger of creating "an island of automation."

As I recall the General's words, he was concerned with the many ventures in data processing that were the sole responsibility of lower echelons of management, ventures that brought about disappointing results. He made the point that data processing had to have "total" systems concepts in order to assure success, and that such a concept made it mandatory for top management to take an active and leading role in the planning and operation of the system.

Of a related nature were the thoughts expressed by Ron Daniels in an article called, "Picking The Computer's Boss." (MBA, March 1959.) Mr. Daniels indicated that many data processing systems were doomed to failure because they were under the control of a man or department—such as the controller or accounting unit—that was confined to such a narrow scope within the individual organization that the true benefits of such a system could never be realized. I wonder if such conditions exist in the areas that you gentlemen are familiar with, or responsible for?

Light at the upper level

MR. KLEIN: Such a situation exists in our company right at this very moment. I think, however, that we've seen the light, and as far as Capital is concerned it will become a top level phase of our business—perhaps responsible directly to the president.

MR. HASLETT: In Shell, we have fortunately had a controller who has been able to effect complete cooperation with the operating vice presidents. Without this, we couldn't possibly have made such progress as we have.

"From an economic point of view, this thing has paid off from the very start through streamlined clerical procedures and the elimination of high cost PLF communication circuits."

I think we can thank controllers generally in American business for having clutched this data processing to their bosom and sold it to operating people.

MR. DWYER: I've got to disagree with you on that. I think that the engineers and the production people are actually much more interested in automating. It is a question of capability—understanding the capability of the equipment. Controllers heading up data processing are going to show less interest in planning and production control applications and very few honest-to-God applications other than the fiscal accounting and the budgeting work.

We have had this experience and while we might thank the controller for finally becoming interested and trying to improve his methods of accounting, and we might be thankful that we have had the opportunity of having a lot of trial and error, which is one of the things we have to go through. I don't think we have too much to thank the controller for as far as automating management information systems.

MR. SPRINGER: I think we probably have a problem of definition here. Responsibilities of the controller vary all over the map from company to company. In our company the accounting department comes under the treasurer and not under the controller. The controller is responsible for systems and procedures, quality control, work standards, and such. In this type of organization the controller might very well be the last person to head up the data processing program.

"No great white father"

MR. DWYER: It isn't so much a question of responsibility, it's a question of controller having background and experience in material production, management, and other problems. You can't actually make any progress when your top man is concentrating on or concerned only with the so-called paper-work shelf in the company. I have nothing against controllers. I just don't see the controller as any great white father who is really trying to plan or improve an inventory control system, or the like.

MODERATOR KELLER: We've had some strong pro and con statements regarding the controllers'

Continued on Page 33

Paper Tape Simplifies Revenue Reporting

While the customer's ledger and a revenue distribution journal are being updated, a perforated tape, a by-product of the posting operation, is prepared for use by an accounting service bureau to develop a series of revenue reports.

PUNCHED paper tape, a by-product of posting, is the key to providing immediate facts and figures on the revenue activity of Howard Sober, Inc., Lansing, Mich.

The company, one of the nation's large truck transport firms, has always required up-to-date figures on business activities to keep its 300 tractors and trailers rolling and its 17 operating terminals showing a profit at all times.

When automatic data processing, electronic bookkeeping and modern concepts of office automation came into the picture, it was natural for Sober to investigate these techniques to learn if they could increase efficiency.

Rex Lamerson, assistant auditor and the man responsible for the present system, was faced with the responsibility of providing revenue, tax, tractor and terminal reports on an up-to-the-minute basis.

It was obvious that his department couldn't produce these figures with any speed unless it had additional personnel and thousands of dollars' worth of electronic equipment. On the other hand, he learned he could secure the services of Capital Business Service.

This unique electronic accounting service bureau operates 150 licensed offices throughout the country, serving thousands of independent business firms. Its headquarters, like that of Sober, Inc., is in Lansing.

Capital could prepare the reports if it had the information. The best way to get the information into shape for processing is to get it into cards or on paper tape. The decision was made to use an 11-total Burroughs Corp. accounting machine with a Tape Perforator attached. This means, Lamerson explained, that the tape, a by-product of posting customers' accounts receivable ledgers and a revenue distribution journal, would supply what Capital needed for its job.

He attributes the success of the system to its simplicity. Copies of invoices are given to the machine operator. She machine writes the customer, tractor and bill numbers, the amount of the charge and its breakdown according to revenue, tariff, tax, interline and/or other accounts.

This—in a single action within several seconds—updates the customer's ledger, the revenue distribution journal and punches the data into the tape. Each posting is also machine-proved for accuracy as it is made.

At the end of each working day, the tape is sent to the Lansing offices of Capital Business Service, and in turn they produce revenue reports by terminal, customer, account, units, amount, tonnage mile, interline and miscellaneous. They also make arbitrary tax reports by state, code numbers and amount, and tractor reports by tractor number, revenue and tonnage mile. A miscellaneous income distribution report by terminal is the final report required.

All of the above information, Lamerson pointed out, is secured with only one handling of the freight bill or invoice. This eliminates the need to handle and rehandle papers and amounts and provides data required to keep management fully informed on revenue progress.

Without this system, he added, it would take many more people in the department—yet it would still be impossible to obtain the information necessary as easily, rapidly and accurately as it is now received. ■

Internal Recruitment—

A Program for Selecting Data Processing Personnel

Psychological testing with professional guidance will assist in the staffing of a computer operation from within the company.

By Deborah L. Blumer

About The Author

Miss Blumer is director of the Special Services Division of Herbert Halbrecht Associates, Chicago management counselling and executive recruitment firm. She holds a master's degree in Clinical Psychology from Kent State University. Her field of experience includes job placement and vocational counselling, school psychology and industrial psychology in research and methods. In her present position, Miss Blumer specializes in the placement of executives in all phases of electronic data processing. She is also charged with helping to determine which people she interviews are qualified to receive training in computer operation and management.

PLACING the "right man in the right job" is essential to the initial and continued success of any automatic data processing venture—in fact it is imperative that the correct choice be made at every level of the operation if full satisfaction in the program is to be realized.

There are several avenues of recruitment open to management, but there is growing evidence that most of the technical personnel needed—including those who can be trained within the time limits of the automation changeover — may be found within the firm's existing employe group.

An "internal recruitment" program, embracing sound personnel practice, figures to benefit management in many ways. It certainly will benefit those employes who are alert to opportunity and have undeveloped capabilities. The problem facing management is the procedure for making the proper selections.

The various pieces of equipment involved in data processing are simply tools that will facilitate a better system. Whatever the equipment, be it keypunch or computer, people are required to make it function.

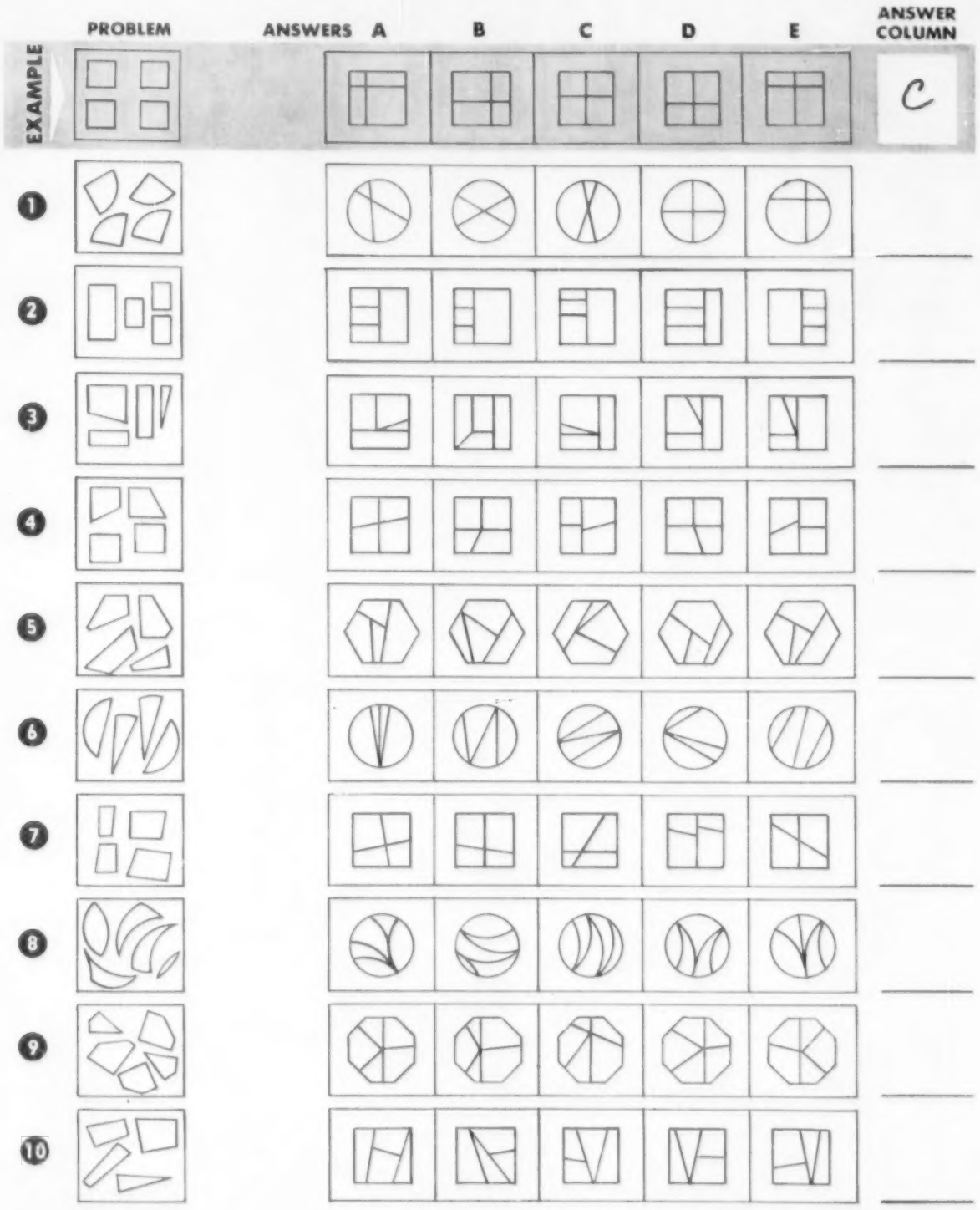
It is people, then, that determine the degree of efficiency which can be expected from any system, and it goes without saying that the finest electronic equipment made is doomed to failure unless competent personnel are supervising and operating the installation.

Depending upon the degree of automation already in operation, a company's new data processing staff will probably include operators, programmers and coders, systems and procedures people, analysts and managers. Excepting experienced EDP personnel already on the job, there will be need for trained people to fill these positions—people who have the necessary aptitudes and personality characteristics that will contribute most to their job success.

There are many methods that may be used to

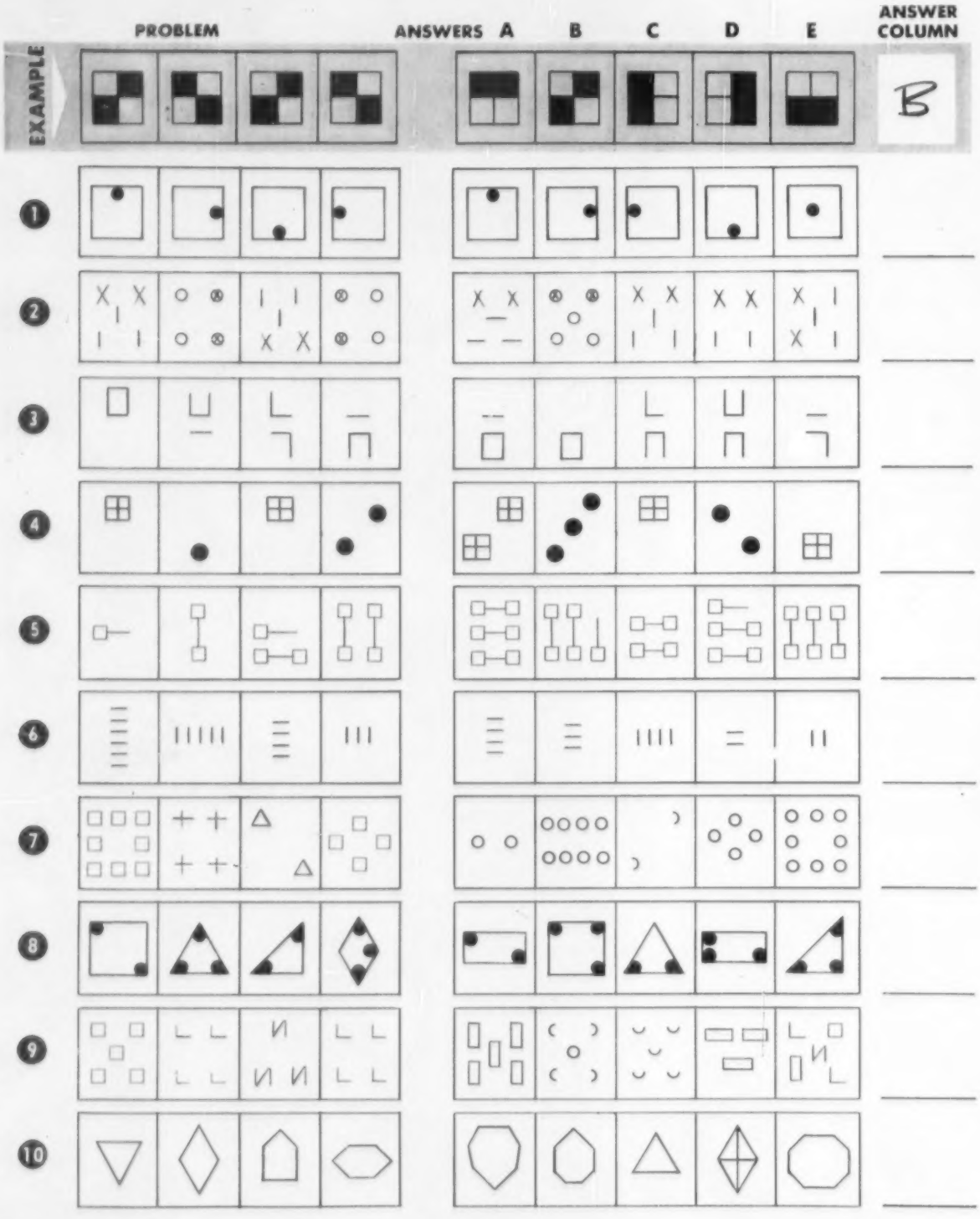
Sample Test I

This is the type of test designed to measure a unique aspect of mechanical aptitude. The problems presented here are similar to those found on longer, standardized tests given professionally. The reader is invited to try his hand at solving the problems. Directions: Imagine the pieces of the problem picture fitted together. One of the answers, lettered A to E is correct. The first problem is an example. Correct answers to the other problems will be found on page 32.



Sample Test II

This test measures abstract reasoning qualities. Again, the problems presented here are only similar to those found on longer, standardized tests. Directions: The first four problem figures form a definite series. Among the answer figures, lettered A to E, is a figure that will be the next or fifth figure in the series. The first problem is an example. Correct answers will be found on page 32.



locate this talent within an employe group—and combining several of the methods produces the best results.

The first step is to find out who is interested. This means announcing the entire automation plan to all the employes. Everyone should have a chance to learn more about the progressive step about to be taken.

The initial announcement of automation plans can cause a number of employes to fear for their jobs—with resulting decreases in group morale. The internal recruitment program avoids this by offering all employes the opportunity to participate in the development of the data processing group. The "all" is emphasized—for female employes, as well as men, can make a definite contribution to the success of the new undertaking.

Elementary school for all

The next step is a short (usually two-three weeks) educational program as an elementary introduction to the concepts of the new system. All employes should be invited to attend. This course is best offered evenings (perhaps several nights a week) and may be taught by someone involved in the planning—with help from the equipment manufacturers' representatives.

Following this introductory course, an advanced course should be offered that delves into more of the technical details of the system. And—beyond the public relations and personal benefits—this is where the classes pay off. Those with the highest degree of interest and promise will be the most likely candidates for the data processing staff. It will not be surprising if some women are listed among the star pupils. Experience has shown that many women do as well as men in learning and applying the technical concepts of data processing, even though they may now be performing totally unrelated duties within the firm.

Other tentative staff selections should be made on the strength of supervisor recommendations from all departments.

Finally, a combination of specialized psychological tests and personal interviews should be utilized to establish which employes would contribute most to the success of the automated program.

The group selected for further evaluation should be small. One error to avoid is unnecessary "wholesale" testing. The tests should, however, be given to those people who really want the chance to participate as well as to those whom the screening process has indicated are the best bets.

Psychological tests are proven tools for aiding management to arrive at better selection decisions, but the tests must be chosen carefully and the results used with caution. They are designed to supplement other screening methods, not to replace them. They should be used to measure the characteristics needed for the job to be filled. Tests should always be used in conjunction with other evaluations and performance records, as well as with personal judgment.

A higher batting average

In this way, results may be viewed in the proper perspective and not used as a crutch to relieve management of its decision-making responsibilities. They can never be considered the "cure-all" or the final answer.

But, tests can help to raise management's "batting average" and are particularly helpful in assessing those qualities that are most difficult to measure in the interview. A very important factor is that tests can be of eminent value when they are professionally administered and interpreted.

These hard-to-measure qualities in staff people are of great importance in making a choice. As an example, take some of the most important aptitudes said to be needed by a programmer. A programmer needs the ability to understand mechanical concepts. He needs to be able to visualize sequential processing and to work with figures and facts. He must have ingenuity and imagination and be able to reason abstractly. He must

Continued on Page 32

next month . . .

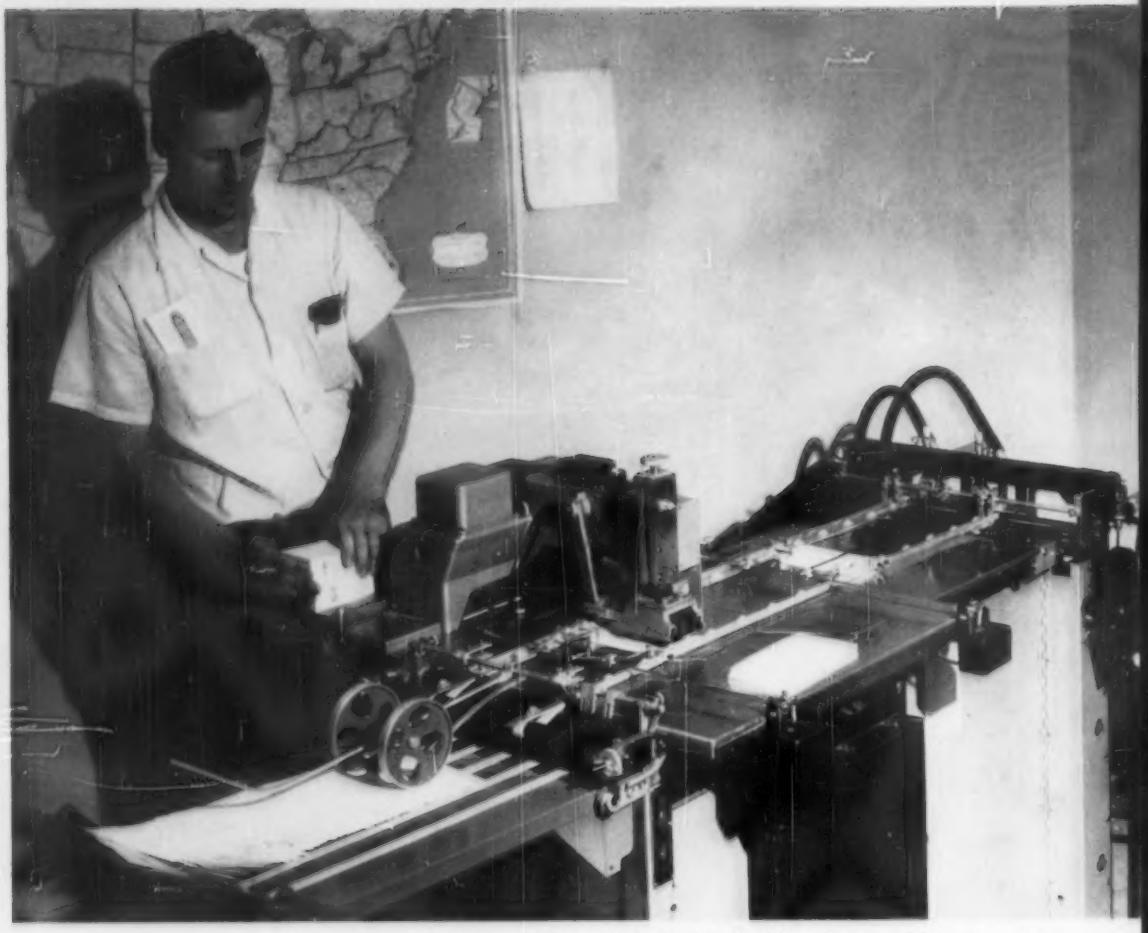
BANKAMERICARD SYSTEM

How automation has brought a more sophisticated way of shopping to over 2 million Californians. The dramatic story of the nation's "first modern credit card system" and the automated techniques that make it possible.

•

Memo: To the 'Programmed' President—

Your Forms Control Program may be just another office empire.



At speeds up to 5,000 per hour, this card-fed addressing machine prepares book club invoices and shipping labels for books to be mailed to any of Collier's 325,000 customers.

Selective Addressing by Tab Cards

SELECTIVE addressing of labels, promotional literature, yearbook invoices and notices at speeds up to 5,000 per hour has slashed billing, shipping and promotional costs for P. F. Collier & Sons Corp., publishers of encyclopedias, books and dictionaries.

Working with punched-card controlled, high-speed addressing equipment, the book fulfillment office in New Hyde Park, N. Y. can process an average 2,000 orders a week from some 325,000 customers.

Since Collier sells its books in combinations of three or more, this means the preparation of 6,000 separate labels for the 2,000 orders. It also means the preparation of some 10,000 forms, cards and envelopes which go to make up the accounting documents required.

Each day "listing sheets" containing orders come from the 42 branch offices throughout the country. Pertinent data is transferred to a set of Remington Rand tabulating cards. The first step consists of typing the subscriber's name, address and account number in a box on the card. This is done on a Scriptomatic Card Writer—a standard typewriter equipped with a conventional ribbon plus a hectographic-type carbon roll. As the subscriber's name is typed on the front of the card, the identical information is placed on the back in the hectographic ink.

This creates a duplicating master for the name

Name and address information is typed and imprinted on a card simultaneously by this Scriptomatic Card Writer. The card is now ready to be used as a reproducing master.

and address, which can be used for some 150 reproductions.

Once this step is completed, an operator keypunches the card with the subscriber's state and city code, the year he is to receive his first order, the first four letters of his last name (to permit machine-sorting of the cards prior to filing), the number of the branch that sent the order and the account number. This information is then compared to the listing sheet and verified.

During the checking operation, the title codes of the books ordered are then punched into the card by hand—facilitated by pilot holes so that the hand punches can be positioned with accuracy.

The cards are now ready for processing in the addressing machines for labels, ledger cards and other media. Later entries, such as payments and kills, are made by hand.

The equipment now being used by Collier is the Model 101-S and the Model 10 addressing machines manufactured by the Scriptomatic Corp. The Model 101-S can read coded information on the tab cards and print, skip, sort, count or otherwise select the card for handling in anyway set up on a "Selective Controls" panel. At the same time that it is imprinting media of different sizes and shapes, it also tallies the cards as they are processed. This provides valuable information and statistics to Collier that was previously obtained only by manual methods.

This equipment, with the selective control feature, has operating speeds up to 5,000 per hour. It has been in use at Collier's since the early part of this year. Since that time the company has learned that it can also put a Scriptomatic Model 10 to good use in addressing documents which do not require the selectivity feature. This unit will imprint addresses at a rate of 7,000 an hour, giving a significant increase in speed where it can best be utilized.

Three is the combination

The job slated for the Model 101-S is the printing of labels for books ordered regularly by subscribers. It also is used to print the invoices and reminder notices for customers who order the Collier Yearbook and to prepare a special promotion, perhaps directed at the most receptive portion of its large list of subscribers.

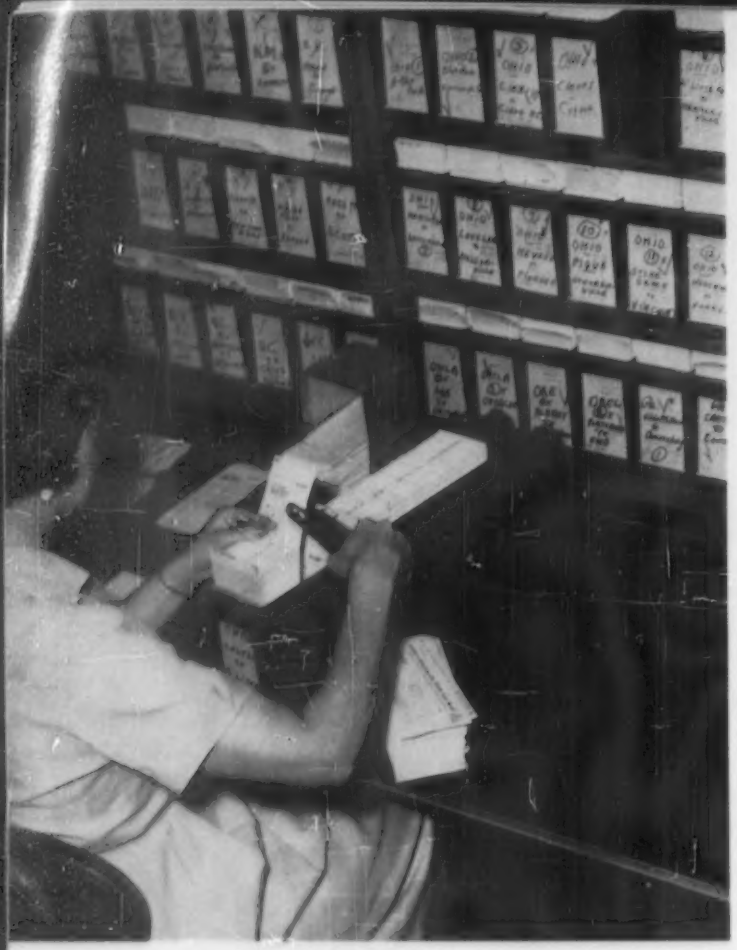
Because Collier sells its books in combinations of three or more, this means a minimum of three labels completed for each subscriber order. After the data has been transferred from the listing sheets to the cards, the deck is then run through the Model 101-S. Since there are 18 titles involved (18 different books offered) there are 18 passes made, one for each title.

On each run, the machine is programmed to transfer the name and address information from the tab card to the label only if the card is punched with the code designating one of the 18 titles. All other cards pass the printing head and the corresponding names and addresses are not reproduced.

It is further programmed to segregate cards from the deck as soon as labels of all three titles selected by a given subscriber have been prepared. After the third pass through the machine, the labels needed for about 50 percent of the orders are completed. Thus, on the next pass, only about half of the original deck is left. During this and succeeding runs, the number continues to diminish, reducing machine time to a minimum.

During each run, as indicated, the Scriptomatic is also counting the number of labels (books) addressed. When all runs are completed, management has a machine count of each of the titles processed. This count is compared to a tally obtained from the listing sheet and provides a positive means of assuring that all labels needed have been prepared. It also verifies the accuracy of book orders sent to the bindries.

The company averages about 2,000 of these orders a week, and one machine operator can handle



Book title code numbers are punched into the tab cards by hand. An addressing machine is programmed to transfer the name and address information to a label if the code number is "read".

about 400 a day. This is done in one and one-half hours and includes time required to address the labels, balance the listing sheet and get the cards ready for each run.

By comparison, C. W. Martin, director of the book fullfillment office, stated that in the past the same job required the full-time services of three people or 24 manhours a day. At that time fiber stencils were used to address labels, and these had to be hand-fed into the addressing machine. They also had to be sorted by hand when the job was completed and then counted manually.

For those who neglect

The company has also put the 101-S to work on addressing the invoices for the Yearbook which goes annually to most of its 325,000 customers. It also is used to prepare up to five reminder notices for those customers who neglect to remit within a given period. These are spaced over three week periods from the date the book is shipped.

Here the ability to address selectively is very useful. Each tab card contains space for showing those customers who do not wish to order the Yearbook and another for payment. When the invoices are sent through, the machine selects only those subscribers who want the book. Each time a set of reminder notices is prepared, the machine again picks out only those cards representing unpaid accounts. Regular counts during these runs provide the sales and accounting department with valuable statistical information obtained as a byproduct.

Formerly, Martin said, it required a regular battery of collating, sorting, reproducing and interpreting equipment to address these invoices and reminders. Because the equipment could not process fiber stencils, the customer name and address data still had to be punched into tab cards.

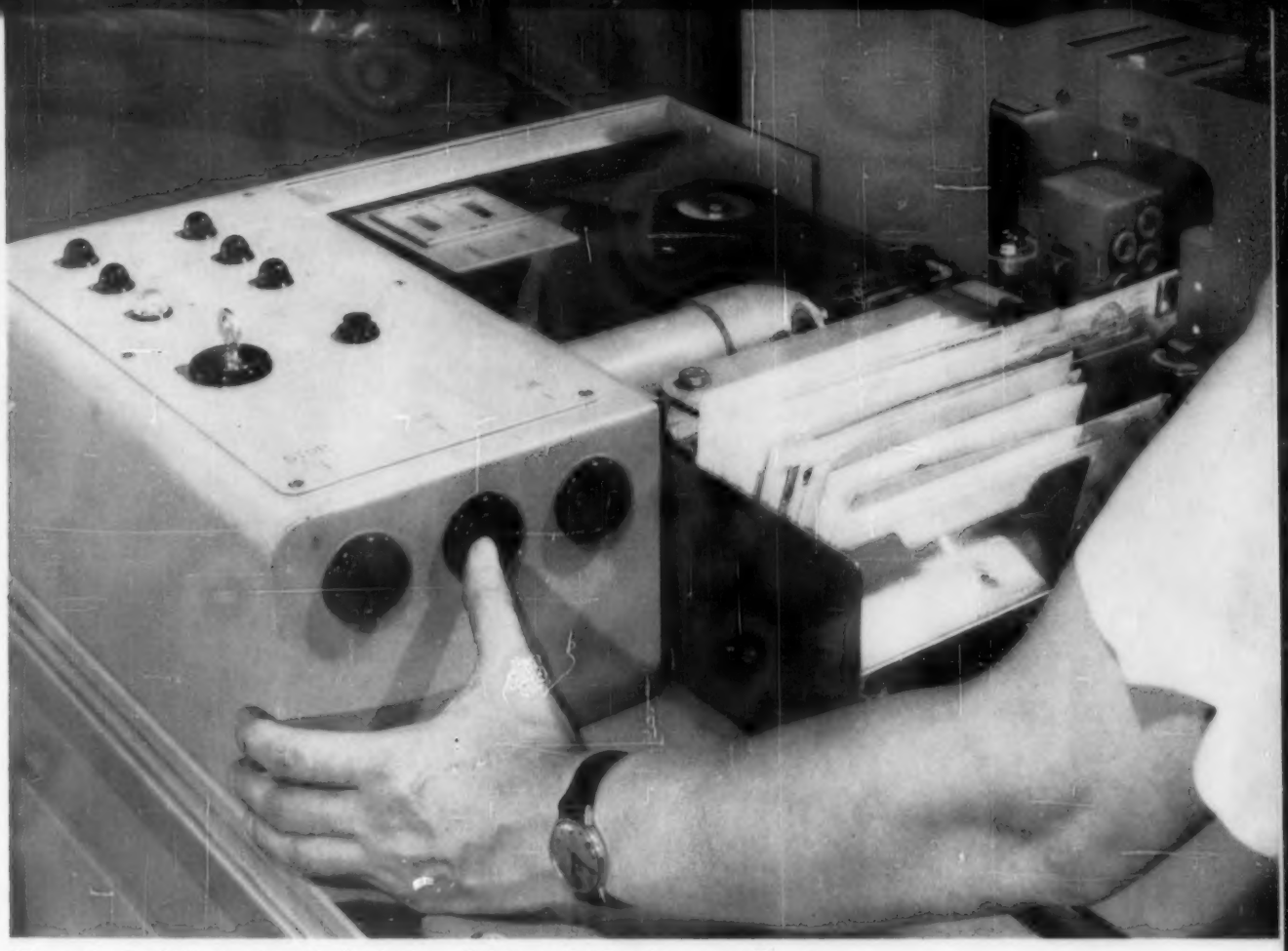
"By substituting one high-speed addressing machine for this battery of equipment," Martin revealed, "we have reduced our capital investment, saved space and saved time. We are now able to process invoices and notices at a speed of about 5,000 per hour as compared to 3,600 an hour before."

Savings of several thousands

The versatility of the equipment is also put to use when the company wants to process a special promotion—either a book or some non-competitive items such as lawnmowers, tablecloths, phonograph records or power tools. A variety of addressing media are used, ranging from tab cards to envelopes measuring six by nine inches or larger. All can be accommodated by the machine. The very versatility of the equipment has also made it useful for sending certain promotional mailings to any part of the customer list.

The Model 10 is now being used to prepare the accounting documents. Each week the office prepares a ledger card for each of the 2,000 orders processed. This ledger card, sent to collection offices in the field, becomes the accounts receivable record of the transaction. As a part of this same operation, two index cards are prepared for each order—used by the branch and collection offices for cross-reference purposes. Two No. 10 envelopes are also imprinted with the customer's name and address. One of these will be mailed to the customer with his book of payment coupons enclosed and the other will hold his coupons which entitle him to make use of the Collier research service.

In summing up the benefits of the new system, Mr. Martin emphasized that the actual money saved should add up to several thousand dollars a year. This means, he concluded, that within three years, the equipment will have saved the company the entire cost of the capital outlay as well as the cost of the conversion. ■



The push of a button automatically feeds mail into an Intelex facer-canceller at the rate of approximately seven letters a second. Letters travel through the machine at speeds up to eight feet a second.

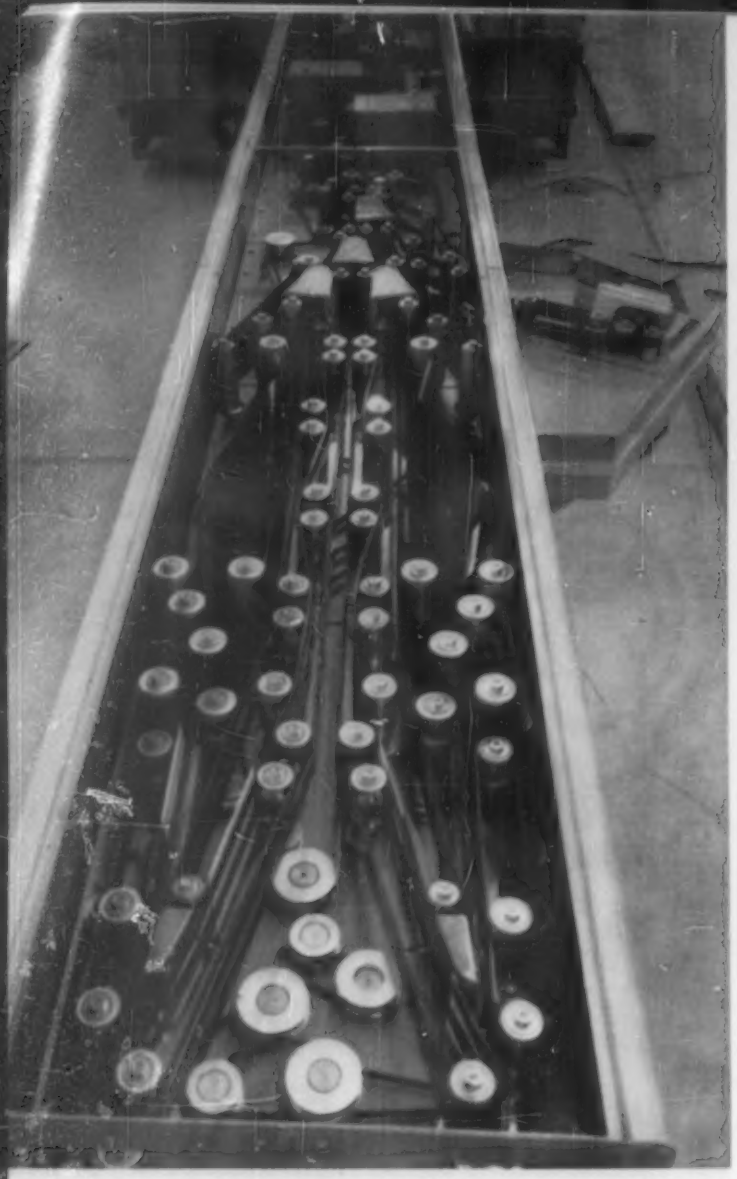
'Project Turnkey'—Push-button Post Office of Tomorrow

THE world's first fully-mechanized post office is under construction at Providence, R. I., marking a major step in the Post Office Department's program of automation and mechanization of the nation's mail service.

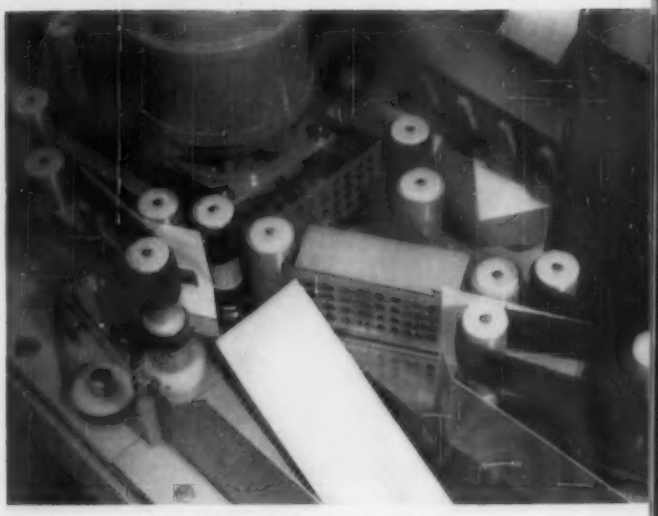
Designated "Project Turnkey"—because little more than a turn of the key in the front door will start the mail moving—the $20 million building will serve not only as the Providence post office, but also as a postal laboratory for the future. Machines specifically designed to improve mail service will be tested at Turnkey, and the knowledge gained will be applied to the entire U. S. postal system.

Equipment at Turnkey will include a cancelling machine that can process 32,000 letters in one hour and a letter sorting machine that will enable six operators to each sort 3,000 letters an hour to 300 different destinations. Machines will also sort parcel post mail.

Turnkey's "nerve" center will be a 26-foot-high control tower located in the center of the work area, which is about the size of two football fields. Tower personnel will have an unobstructed view



An electronic switchyard for letters—the facing and cancelling machine twists and turns envelopes and cards until they are all facing the same way with stamps in the proper position for cancelling.



If a letter is already cancelled, has no stamp or is otherwise destined for special handling, it is automatically switched out of line before it reaches the cancelling head.

of the 118,000 square foot area housing the mail processing system, and the tower will contain electronic console and communications equipment that will provide push-button control over the entire operation.

The multi-million-dollar project is being constructed and equipped by Intelex Systems Incorporated, a subsidiary of International Telephone and Telegraph Corporation. Upon completion, scheduled for September 1960, the building will be leased to the Post Office Department for 20 years.

Backbone of the automated system will be a series of mail processing machines designed by Intelex Systems Inc. Much of the equipment, such as the letter sorter, is already in regular operation at the Post Office Building in Washington, D. C., while other pieces are in operation at the P. O. laboratory there.

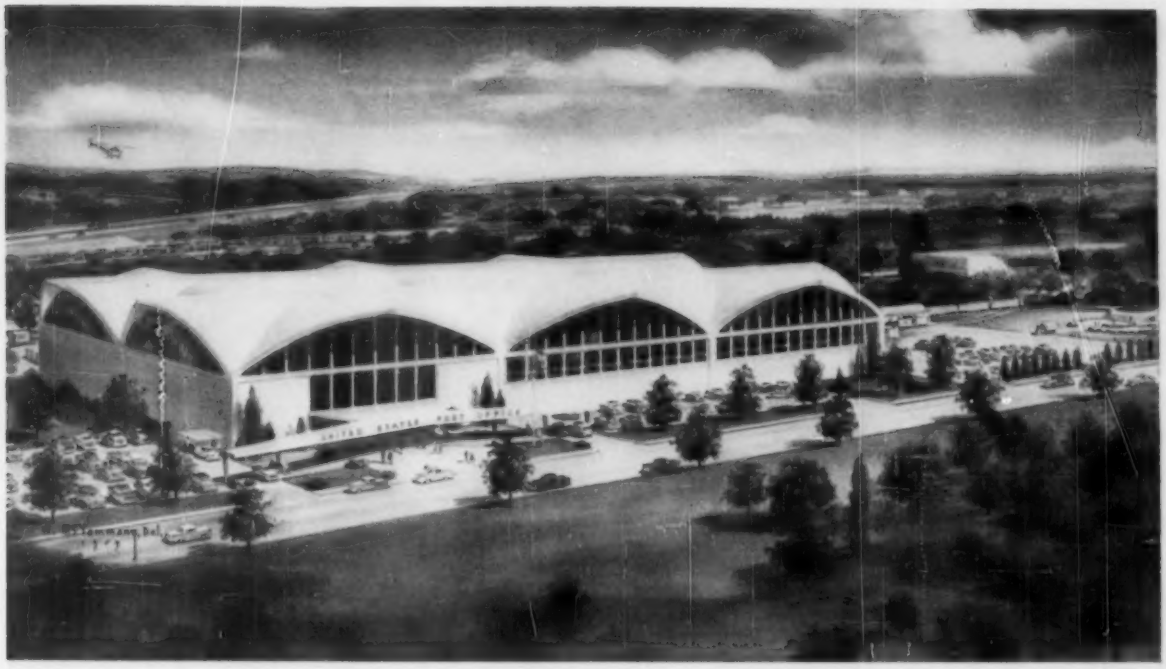
At Turnkey, the machines will be fed, unloaded and interconnected by a complex of automatic conveyors that will assure rapid, reliable mail flow between all processing stations.

Mail in the raw

The automated operation will begin when the postman drives his truck to the Turnkey unloading dock. In the rear of his truck is a specially designed crate into which he has deposited the "raw" mail received from the collection boxes. At the dock, the crates of raw mail are unloaded and hung on carriers of an overhead conveyor that takes them into the building for processing. A dial on the carrier is set and automatically routes the crate to its destination. It also informs the operator in the control center that a basket of mail is entering the production line.

The crate is carried on conveyors to the hoppers of an Intelex Systems' "culling" machine. Here, the raw mail (standard-size letters, over-size envelopes, packages, hotel keys, newspapers, magazines and other printed matter) is culled or separated by an automatic system of vibrating trays, chutes and conveyors. Packages and large pieces of mail, along with letters too thick or stiff to be processed with regular mail are removed by conveyor belts for further separation.

The culled mail which can be machine-processed is conveyed to a "stacking" operation where the



This architect's drawing shows the exterior of "Project Turnkey", the first fully-mechanized U.S. Post Office, under construction in Providence, R.I.

mail is placed in a vibrating holder which shakes the mail into alignment for the next operation—automatic facing and cancelling.

The stacks of aligned mail are fed automatically into an Intelex facer-canceller machine at the rate of approximately seven letters and postcards every second. In the facing operation all letters are arranged so that all destination addresses are on one side. A series of scanning heads, using photo-electric cells, determines whether the piece of mail is a letter or postcard, and whether the stamp on the mail is in the upper right hand corner or the lower left hand corner. The electronic eyes also telegraph ahead the location of the stamp. The mail is processed through two inverted belts which turn the letters over so that each piece arrives at the cancellers with its stamp in the proper (stamp down) position. Unstamped mail, pre-cancelled mail or wrongly stamped mail is automatically switched to a special handling area.

The canceller is also activated by electronic eyes. On one side of the machine stamps on the leading edge of the mail are cancelled, while on the opposite side, stamps on the following edge are cancelled. After facing and cancellation the stacks of mail are placed in trays and sent by conveyor to the semi-automatic letter sorter.

When the trays arrive at the Intelex sorter they are placed immediately adjacent to the machine operators. The letter sorter machine has a capacity of six operators and 18,000 letters per hour. It has a central memory system which controls the movement of each letter through the conveyor system and deposits it in the correct destination box on the outside of the machine.

A vacuum head removes the individual letters from the tray and places them on a conveyer that carries them past the operator at a rate of 50 per minute. The operator reads the addresses and presses numbered keys corresponding to a serial number assigned to the letters' destination. For example, if the code number for New York City is 333, that number will be flashed to the memory circuit of the Intelex sorter. The memory retains the number until the conveyor carries the letter to Destination Bin 333. Turnkey will have 981 separate destination bins for outgoing Providence mail.

Sorting by memory

Once sorted the mail is removed from the destination boxes at regular intervals, machine wrapped and tied, and placed on a conveyor for delivery to the "sacking" area.

The sacks are labeled and tied and carried by conveyor to an outgoing assembly line. From there, they are loaded on trucks for delivery to the airport or the railroad station.

Parcel Post sorting at Turnkey will be handled by an electro-mechanical sorting device known as the "Webb Machine," a product of the J. B. Webb

Letters move to the various sorting conseles on chain-operated racks. Each letter is picked off the rack by a pipe-like suction device and placed to move laterally past the operator. She, in turn, depresses certain keys to send the letter to a designated compartment. Six operators can sort 18,000 letters an hour.

Conveyor Engineering Co. The machine has an hourly capacity of 14,400 parcels, sorting them to 32 destinations.

Standing at the keyboard, a sorting clerk dispatches a package to its destination by transmitting its coded address to a conveyor memory system. As the code is keyed into the system the package is placed on a pallet that appears from under the clerk's platform. The pallet travels over a series of transverse conveyors and when it arrives at the proper "address," the pallet is tilted and the package is dropped into a hopper where it is conveyed to the sacking area for delivery.

From bombs to missiles

Mechanization of post offices has been studied for many years in the United States and elsewhere; but in some European cities particularly in Belgium and Germany, postal authorities and engineers were able to put such ideas into action because so many post office facilities were destroyed during World War II and had to be rebuilt.

In Belgium, ITT was assigned to design and construct a semi-automatic mail sorter. In Germany ITT was given the task of developing facing-cancelling machines and letter culling devices. The results of this extensive research and development will all be in operation at the new Providence post office.

Project Turnkey is not the only move to automation being made by the postal department. The ultimate goal is one-day delivery of mail anywhere in the United States, and Postmaster General Arthur Summerfield is pulling out all the stops to achieve the goal, using everything from mechanization to missiles, plus $80 million appropriated by Congress for modernization in 1959-60. The task is no easy one for Americans now send and receive more than two-thirds of the world's mail each year. As a result the post offices handle some 61 billion pieces of letter mail and over a billion parcels each year. Volume is nearly $4 billion a year and total employment is over half-a-million men and women.

For the most part mail is still being processed by methods and equipment devised during the days of Ben Franklin, but the changes are coming fast. In addition to Project Turnkey, an even larger fully mechanized postal facility is in the

The "other side" of the sorting machine, showing the hundreds of destination boxes where the sorted letters accumulate. They are collected and bundled periodically and sent to a departure area.

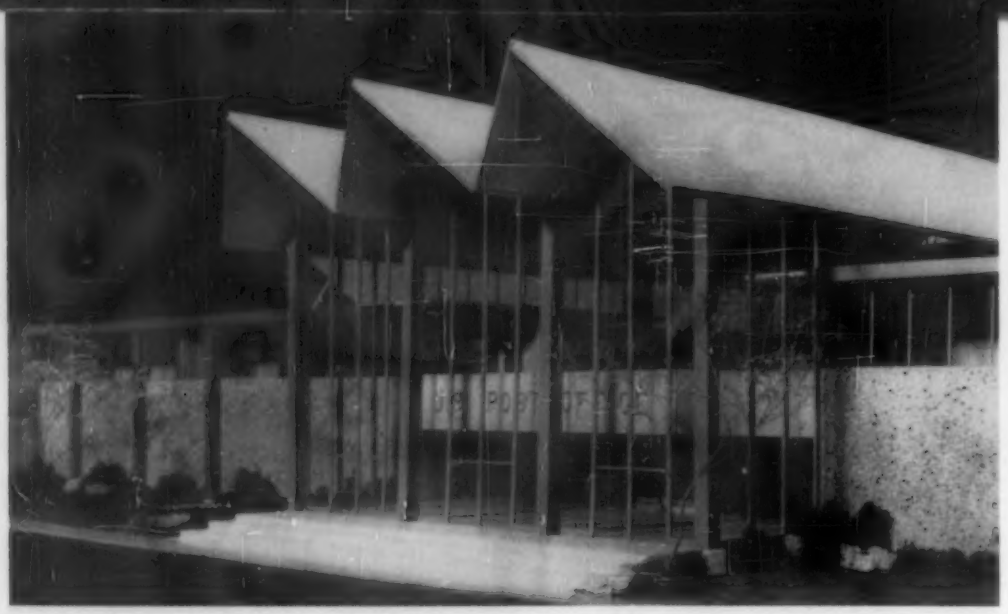
process of development. Called "Project Gateway" the new system will be built at Oakland, Calif. and will be designed and constructed by the Food Machinery and Chemical Corp., of San Jose, Calif.

Just recently the Burroughs Corp. delivered the first of ten letter sorting machines capable of sorting 43,000 letters an hour to 279 destinations. The machines, first "made-in-America" letter sorters, are being built by Burroughs under a $1,869,000 research and development contract with the Post Office Department.

Fast Mail to Mayport

Pitney-Bowes, Inc. is scheduled to deliver a "Boxer" mail sorter for post office use in Washington next May. Boxer will seat 12 operators and sort 1,000 letters a minute to 300 destinations. Pitney-Bowes have also been asked to develop a machine for the post office that will sort mail without an operator. Company officials indicated that the key to this project will be phosphorescent ink markings on letters which will allow them to be

When a package reaches an operator, he puts it onto a tray and records its destination on a memory device by means of the keyboard (picture above). When the moving pallet containing the package reaches the proper chute, a tripping device tilts the package off.



"Project Gateway", another new, and larger, installation which will be constructed in San Jose, Calif. It will be the largest fully-mechanized post office in the world.

sorted electronically by a reader machine at high speed. Advantage of these markings, according to Mr. Walter H. Wheeler, Jr., president of Pitney-Bowes, is that eventually code addresses can be placed on letters by the sender, such as a large firm, eliminating manual handling by the postal sorters.

In October the Post Office Department awarded a $114,000 contract to the Intelligent Machines Research subsidiary of Farrington Manufacturing Co., for development of electronic analyzing, automatic reading equipment, and for producing an engineering test model of a completely automatic letter sorting machine.

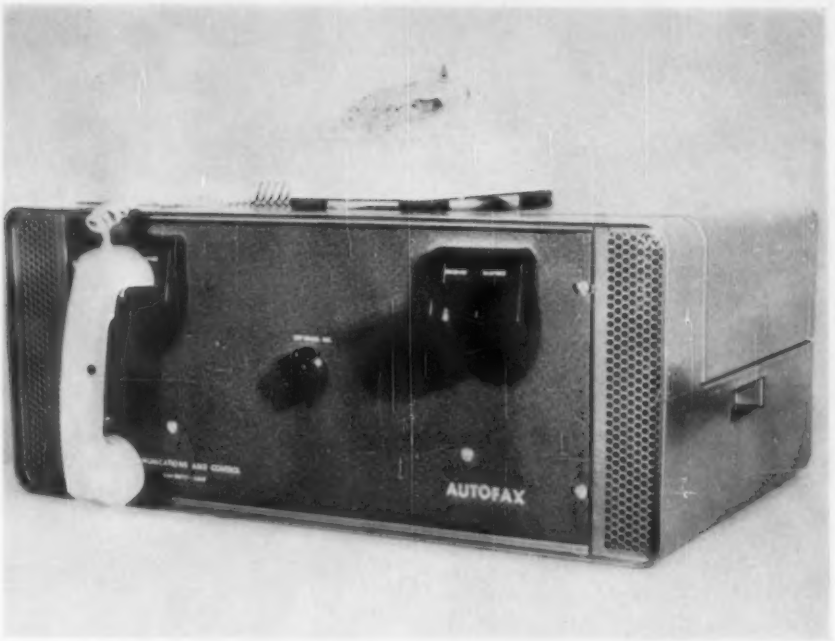
The 18-month contract with the Farrington subsidiary calls for a machine that will sort at the minimum rate of 10,000 letters per hour, more than three times the rate per person operating semi-automatic sorting machines currently being tested. An experimental model of the address reader has undergone two months of laboratory testing in Washington. Although it will read only printed or type addresses, the Post Office contract calls for research into the reading of hand-written addresses.

The most revolutionary experiment for faster postal service occurred on June 8, of this year, when some 3,000 letters were dispatched from the Guided Missile Submarine USS Barbero in a Regulus 1 Training Guided Missile. The mail missile landed successfully at the Auxiliary Air Station at Mayport, Florida a few minutes after firing. According to Postmaster General Summerfield, missile mail will probably be developed to a significant degree before "man has reached the moon."

Currently the Post Office Department is experimenting with facsimile transmission of mail, a process similar to that used by Western Union to transmit telegrams directly to the customer's office. Facsimile itself is not new, being successfully used for many years by newspapers for transmission of pictures over wire. Just how the post office visualizes the use of facsimile to expedite mail delivery has not yet been revealed. Congress has already expressed concern over the possible "violation of secrecy" involved in such a plan.

Automated avalanche

This, however, is just one of the obvious problems presented by facsimile transmission. Some of the other involve recreating an envelope at the receiving end, and lack of color transmission, to mention a few. But it is a credit to the postal authorities that no possibility for improvement of service is being overlooked. They realize that antiquated facilities along with outmoded methods and equipment make it presently impossible to maintain any degree of efficiency. And the available statistics make the future seem even darker. The department's statisticians foresee a per capita volume of 700 pieces of mail annually within the next 25 years, a total twice as great as the present. By 1985, they estimate that a population of 200 million Americans will raise the volume of mail to the staggering total of 140 billion pieces. It is apparent that automation must be brought into action, and swiftly, less the entire postal system be swamped by the growing avalanche of mail. Project Turnkey is a milestone in that direction. Other "post offices of tomorrow" will soon be in the building stage as the skills of American industry are applied to the postal problem. The mail will continue to move, thanks to mechanization, missiles, and the pioneering spirit of the Post Office Department. ■



With "Autofax", alpha-numeric data can be sent from one tape unit, typewriter, or other equipment to a similar piece of equipment over long distance telephone wires.

Data Transmission by 'Autofax'

An MBA Product Preview

TRANSMISSION of data between electric typewriters, digital voltmeters, magnetic tape units, punched paper tape equipment, core storage units and magnetic drums over regular telephone lines is now possible with "Autofax", a development of the Communications and Control Division of Franklin Electronics.

Using Autofax, alpha-numeric information can be sent over long distance telephone wires at speeds up to 70 words per minute at toll call rates.

All that is needed for operation is two Autofax units, one acting as a transmitter and the other as a receiver. The calling party dials or calls the receiving party and then hangs the telephone handset on a special bracket. The Autofax is set on "Transmit" at one end and "Receive" at the other end, where another handset is also hanging on a bracket.

Transmission is possible by acoustic coupling through the telephone handset or by electrical connection to the transmission medium. Each unit operates as half of a semi-duplex system and can receive or transmit data. The system permits transmission of several level (bit) data. For alpha-numeric data, a single parity check is provided. For BCD data, three parity bits are provided. Line pops, dial throughs and other noise signals are integrated out of the signal transmitted.

Autofax takes numbers or letters and converts them to binary code. It then uses the code to turn on two audio oscillators (tone generators). The tone generators can be heard by the human ear and the unit sounds like a cricket in use. The telephone transmits these sounds and the unit on the receiving end translates them back into numbers and letters.

Each system is especially designed to work either with the electric typewriter, the card punch, adding machine or other devices, and prices vary according to the specification.

Autofax can also be used to transmit alpha-numeric information at high speed over telemeter or microwave lengths, to record data on low cost audio grade magnetic tape recorders at any accuracy desired, and as a memory unit capable of remembering and reproducing alpha-numeric information.

The system was originally built for the Sandia Corp. in atomic weapon test, but is now being put on a production basis for general business use. Some units have already been delivered and the company expects to reach adequate manufacturing capacity by the end of this year. Circle No. 12-23

A push of a button at the main dispatch station (above) sends mail basket to the proper receiving station (below) where a floor clerk picks it up and sorts it by distribution points. Mail can be sent from any floor to any other floor, as can other documents or messages.

Magnetic Mail System Speeds Data Handling

AUTOMATIC mail handling was literally a foregone conclusion when the expanding business of Mutual Service Insurance Companies in St. Paul, Minn. necessitated a three-story addition to the headquarters building.

The weekly average for mail was 12,000 pieces incoming and 26,000 outgoing. Previously two mail boys had delivered the mail by hand in the two-story building, but even then they could not make a complete delivery and pickup on one trip because of the volume.

With business expanding and the building expanding, it was obvious that the mail-boy delivery routine was not going to work. The completed office and storage space in the building covered 135,000 square feet spread over five floors and a basement.

The answer was found in Maitrol, a conveyor system based on magnetic control and manufactured by Maico Electronics Inc., a subsidiary of the W. A. Sheaffer Pen Co.

Mail is "addressed"

At Mutual Insurance, incoming mail is received in the basement mail room. It is sorted and placed into baskets. Small "address" tabs on the basket carriers are magnetized, just as iron is magnetized, as the baskets pass before a "record head stack" at the dispatch station. Push buttons on a "Dispatch Selector Panel" determine the magnetizing polarities of the record heads. This, in turn, determines the destination of the mail baskets.

As each individual unit travels along a moving conveyor line, it passes "read heads" which sense the tabs. When the right tab is read, a contact closes and diverts the consignment to the proper receiving station.

Once mail is sorted at the receiving station, it is quickly distributed on the floor by clerks who also double as file clerks. Outgoing mail is picked up at the same time and immediately sent to the mail room.

At this point, a floor clerk—who is also a file clerk—picks up the mail and delivers it to the various floor locations. At the same time she picks up outgoing mail and dispatches it to its proper locations via the basket.

With the new conveyor providing automated delivery to each floor, a complete delivery and pick-up is accomplished within seven minutes. The schedule now maintained is every hour on the hour. This is increased to every 30 minutes during rush times and to every 15 minutes for early morning delivery.

Commenting on the new installation, L. E. Weber, Office Services Manager, said: "This new mail handling system is one of several modern steps taken to provide rapid data processing in our office clerical operations."

"These steps," he emphasized, "have facilitated our change-over to a unitized or decentralized plan of operations. They have been necessary to enable us to keep pace with our rapid growth in the fields of life, fire and casualty insurance."

Mutual Insurance Companies anticipate further growth in their operations. The main building was designed to accommodate five additional floors, and the Maitrol system was designed to grow with the building.

Although it has only been in operation for a few months, the system is already credited with permitting more efficient operations and tighter work schedules on the various floors. One of the initial benefits derived was a saving in time which would have been required for mail boys to travel on elevators from floor to floor.

A 'Speedy Claims Service'

Prompt, scheduled mail deliveries facilitate the company's service operations. There is no work pile-up while mail is awaited. The company's Speedy Claims Service (where a check is mailed within 24 hours after receiving a claim) has been made simpler because processing gets under way a good deal faster. Claim records and other information from the active and inactive files are also moving from floor to floor on the system, greatly speeding up the flow of this data.

Push-button mail dispatching has become a part of better customer service at the Mutual Insurance Companies headquarters. ■

Internal Recruitment

Continued from page 19

understand why a computer functions as it does, and he will have to figure out why it goes "haywire."

A programmer should understand the logical design of the computer. He must also have a broad conceptual approach and be aware of his own function as well as the impact of this function on the entire system. He must be able to think and plan ahead.

These characteristics can be spotted and best measured through the use of psychological tests that will help management to ascertain how many of these qualities an individual has in comparison to all the other people who have taken the same tests.

To better understand what type of tests are under discuesion, two samples appear on the adjoining pages. These are not actual tests, but they demonstrate what is presented to the candidate. It will also help the reader to see how he might rate in the qualities that he expects from the EDP staff members.

The second crucial area in testing candidates involves personality. How well will the staff work as a team? How will they work under sustained pressure? Will the manager (or managers) be able to direct his attention to the people over him as well as under him? These questions carry a lot of weight in any decision.

The higher level of individual responsibility, the more significant will be the role of these personality characteristics in the success or failure of the program. They are very pertinent factors which can be best evaluated through the use of projective personality tests.

Sharp packaging

Most people, especially at the managerial level, consider themselves as pretty good judges of character. Many actually possess good talent for selecting personnel. But when it becomes necessary to select a man for an important job, it can be very expensive to choose him because he made a good impression in a short interview. Some applicants are very sharp at "packaging" themselves. There is much too great an investment going into the new system to afford a misfit on the staff.

A well-rounded battery of tests measuring general mental ability, a unique area of mechanical aptitude, abstract reasoning and personality take only several hours to administer. These can also be given to groups of 10 to 12 at a time.

On completion of the evaluations, however, test results should be discussed only on an individual basis with each participant. During this discussion, interview evaluations and judgments are also made—these can later be combined with test results to allow a better founded conclusion.

Interpretation of test results should not be kept secret from the people who took them. Management, on the other hand, does not need to know—nor should they know—the test results of each individual. The misuse of such test results could be most damaging to the individuals involved.

What management does need is the identification of those people who show the greatest suitability for the jobs offered. This information can play an important role in making the best ultimate placement decisions.

Psychological interviewing and testing, while not fool-proof, can be valuable to management in the critical task of selecting the "right man for the right job." They represent a systematic approach to a difficult job and can go a long way in providing a competent staff for an electronic data processing program—from within the company ranks. ■

Check your score

Here are the answers to Sample Test I: No. 1—D, No. 2—A, No. 3—D, No. 4—C, No. 5—E, No. 6—C, No. 7—B, No. 8—B, No. 9—A, No. 10—E.

Here are the answers to Sample Test II: No. 1—A, No. 2—C, No. 3—B, No. 4—C, No. 5—D, No. 6—D, No. 7—E, No. 8—A, No. 9—A, No. 10—A.

As it was explained on the test pages, Test I measures mechanical aptitude and Test II measures abstract reasoning. From these samples, it would not be possible to determine how well the reader would do on the longer tests, professionally administered, but it does give an idea of the reader's aptitude.

There is a time limit on each test, and naturally, the faster the test is completed with successful results, the more natural talent the candidate reveals. If the reader answered 15 of the total 20 problems correctly, and without too much difficulty, he can assume that he, too, shows a natural ability. These scores must be balanced, in a real test, with the evaluations of intelligence and personality before any direct results can be compiled.

It has been successfully demonstrated that individuals who do well with these kind of problems will ultimately be able to perform well in data processing work.

Washington Roundtable

Continued from page 14

contributions toward data processing—statements that would seem certain to invoke some further response from our readers. I see Mr. Haslett has another comment.

MR. HASLETT: I would like to lay a very controversial problem on the table and have you fellows shoot at it. My position has been, and still is, that we have not, in the seven years or so that we've been exploring data processing, yet found sufficient economic justification for the installation of medium or high-speed computers of any make solely on the basis of accounting, clerical or administrative activities.

Electronic paper pusher

We are a nationwide company and we developed our computer setup from the grass roots. We have a dozen or more medium-speed computers in the field and in headquarters in New York. A high-speed computer will be delivered some time next year. The justification, however, has come from technical, scientific or engineering sources. Where we do have administrative data processing on our computers it is merely on a free ride, because in the petroleum industry, particularly, this is a highly controversial subject. I might add that I am in the minority in thinking in this position.

Very, very few people, few other oil companies agree with the statement that I've made. I'd like to hear some conversation on that.

MR. MORGAN: First of all, I would differ with Mr. Haslett, inasmuch as we feel we can justify a large scale multi-purpose computer for strictly clerical and paper pushing data processing. Of course, I think we all realize that the railroads are required to handle vast amounts of statistics for governmental agencies, Interstate Commerce Commission and that sort of thing, as well as our own internal control. Our needs are different than a company not so rigidly controlled. We have more of a problem, I think, so far as the clerical job is concerned.

That is not to indicate in any sense that we are not looking forward to using this equipment for things which have never been done before. We do expect to do such work, but as far as the specific question of economic justification in the field, we feel that it will pay off on work that we have previously done by other means.

And I would like to touch on the subject preceding this one because I think that I might have something to contribute in regard to inter-departmental barriers in data processing. In my experience, not only with the B & O but other places, I think that such barriers existed even more with conventional equipment. Actually in our case, the electronic data equipment, especially large-scale, almost forces us to break-down these barriers because of the tremendous cost of the equipment.

In our company we have an active, interdepartmental, integrated data processing committee which is so representative that it includes the management of labor relations. With our union setup, this is particularly important. The committee has been selected by the president and the men who are on it are just below the vice presidential level. In fact, there is one vice president on it. These men have really been responsible for breaking down the barriers. One member of the committee is the controller, who incidentally happens to be vice chairman, but the assistant to the vice president of operations is the chairman.

Interest at the summit

MODERATOR KELLER: Where the committee approach has been used and where top management has genuine interest in the progress of the committee, it seems to be working out rather well. I find more and more corporations moving along that line with considerable success.

MR. MORGAN: In my observation, that is true when it is a genuine active committee backed up by the top management, the president.

I've heard of other committees which have been formed as sort of rubber stamp organizations, and I don't think you can give them much credit. In our case, it's worked out very successfully.

MODERATOR KELLER: Getting back to Mr. Haslett's question on cost savings, let's call on Mr. Springer for the insurance viewpoint.

Computer indigestion

MR. SPRINGER: We are fortunate in having a separate data processing department that reports directly to the executive office. In addition to that, we are extremely fortunate in having a president who understands the economics of data processing.

On paper, we can definitely justify a large computer on clerical operations. There are, however, many companies who can prove this on paper. Then they bring in computers, and a year or two later they may perform post mortem cost analysis and wonder "where the yellow went" so to speak. We are much more interested—and this is due to our being a very dynamic and rapidly growing company—in clerical operations on a computer from a standpoint of speed, accuracy and easing our growing pains. We are extremely interested in accuracy and in service to our policy holders since we are a direct writing insurance company.

We are also interested in control of management information, so even though we feel we can prove our savings in the clerical areas, this is not our prime reason for going to a large computer.

MODERATOR KELLER: Mr. Burke? You represent a CPA firm which is, I believe, unique in the fact that it operates a data processing service.

I think we would all be interested in some further view points, from the small computer users standpoint.

MR. BURKE: I've been a very interested listener. It sounds as if our problems aren't unique to us and your problems are not unique to yourselves. We have no intention of making our computer a digestive system. We are not going to use it to gobble up large quantities of data and do the work that could be done in any other way.

We intend to use our computer as a means on the side of regular book-

keeping and accounting functions of the organization, to compute from our machine the statistical and cost variance reporting, and simulation reporting, which even small businesses need.

We were told by many people in the accounting profession that when you get a computer, it has such a large cost that you have to cram all types of work onto it to justify the expense. This philosophy has been expressed by a lot of CPAs and people outside the profession.

We are in a specific location, concentrated in a small area, clients who can hand us the tape they prepare. Their record keeping is conventional. We get them a vast amount of statistical information at practically no extra cost. Our LGP 30, doing error-checking and other routine work in the process of reading the tapes, has eliminated some of the drudgery—the menial clerical work—that had been required previously.

The correct perspective

MR. HASLETT: We have had a dozen or more computers of medium speed for the last five years, using them predominantly for technical, scientific and engineering applications. Clerical and accounting applications have been put on these already-justified computers for a free ride. We are having a high-speed computer installed next year for the technical applications which we feel the medium-speed units cannot handle.

I'm not against computers, but I think they should be considered in their correct perspective.

MR. KLEIN: When we got into the reservations phase, we faced a big question: "Do you get a special purpose machine or a general purpose machine?"

We decided on the general purpose machine essentially because we wanted to grow with this thing and have the flexibility of using it for more than just reservations.

For several years various airlines have toyed with automation on a piecemeal basis. After considerable discussion and research on our part, we decided to lease a file computer to store the entire inventory of seats which we have for sale every day throughout the airline. From an economic point of view, this thing has paid off from the very start through streamlined clerical procedures and the elimination of high cost PLF communication circuits.

But the real factor, the real gain that we get, is the vast improvement in the control of our seat inventory and the elimination of the time lapse that was necessary in our manual operation.

Ethics of a salesman

MODERATOR KELLER: Mr. Dwyer, you made a brief reference earlier to the problem of "ethics." I recall some recent statistics that indicate a considerable number of data processing users feel that salesmen oversell their products and that adequate service is seldom rendered. Would this have any bearing on your reference to ethics?

MR. DWYER: That's part of the ethics problem. No computer is worth its salt unless it's backed up by a top engineer. When you find a good installation, you will always find a top engineer who is keeping that equipment right up to snuff.

But the ethics problem I was mainly thinking about was strictly the question of what the salesman doesn't tell the customer. He knows in many cases that if he lays out the actual cost of the installation one year from now, it's going to be significantly higher than the initial sales pitch indicated.

If I were a salesman, I too might be tempted not to discuss things that perhaps would be very evident a year later. He may honestly think it is better not to bring these facts out into the open.

This problem persists throughout industry and government in installation after installation. You go through a very rigid justification and evaluation—then a year later you try to document the actual cost and the savings that were projected, and you have some very serious problems.

MODERATOR KELLER: What about your own staff responsibilities, Mr. Dwyer? It seems to me that while the salesmen might overstate his case, and try to hold down the figures, the men he is selling—your systems people—are responsible for acceptance of the proposal. Isn't it their responsibility to go to management and say, "His proposal is not correct?"

MR. DWYER: That's correct, and a great deal of this actually is prevented because of that particular type of systems staff in the Bureau shop, but it still doesn't take care of the total.

Again, you've got a training problem. The systems people in many of the activities are going through a training process themselves, and actually the talent hasn't kept up with the hardware potential. We're way behind the capabilities of the equipment.

It is following the same historic pattern of the machine accounting installations, where the only one—for the most part—that knew what was being done was the supervisor of the tabulating installation. It was a complete mystery to top or middle management.

MODERATOR KELLER: At Shell Oil, Mr. Haslett, with your many million points of equipment, have you experienced similar problems?

They said it couldn't be done

MR. HASLETT: We use the staff of the methods and procedures department as an evaluating group. In most instances, in cooperation with other departments, they are able to either substantiate or reject the addition of equipment.

This department, as well as the newly formed data processing department, is more often better informed than the equipment salesmen themselves.

In many cases we have gone to equipment companies, large and small, and said, "Here are our needs. Our equipment, we think, can do it." In one instance where the chief production engineer of the largest of these companies disagreed that his equipment could do the job, we showed him how it could be done.

MODERATOR KELLER: Getting back for the moment to this problem of computer justification on the basis of actual dollar savings over previous methods, it is my experience that many companies do a rather superficial job of estimating the "before" costs. One exception noted recently was the Merchandise Bank of Chicago (MBA, September 1959). Before they decided upon any equipment they established the exact cost of each operation that was to be mechanized. With these

"replaceable" costs they were able to determine the exact savings that would be brought about with mechanization.

I wonder how many of the companies represented here actually had knowledge of the true costs of their operations before they went to data processing. For example, Mr. Springer, in the insurance field, as you picked up various operations did you actually know what they cost before you converted, or did you take a shot in the dark?

MR. SPRINGER: No, we pretty well knew what everything cost since our budget was based on a unit cost.

MR. DWYER: Did you price tag the individual operations?

MR. SPRINGER: Yes.

MR. DWYER: This is unusual. Few have actually broken down the price analysis of the actual operations. Most have taken the over-all cost.

MR. SPRINGER: Possibly we would have taken that approach, but fortunately, the information was available.

MR. HASLETT: This costing is relatively easy in administrative procedures, but I wish somebody here would tell me how to do it in the vast field of technical applications. How do you price that type of thing? In some cases you are applying a computer to do things that could not practically have been done by any other technique.

MR. DWYER: We're struggling with that problem in the shipyards. The scheduling problem there has tremendous potential payoff, but the measurement is very difficult. We're making some headway through the use of mathematical scientists who are actually doing O-R on the project. They're making progress, but it's awfully slow and difficult going.

MR. HASLETT: Then when they come up with a figure, who is going to check it?

MR. SPRINGER: Many times you have to go to top management and ask them to put price tags on the projects. This should be done before a lot of time and effort is spent on research.

Too often you'll study something, spend weeks and months on it, and say, "Well, we can do this for $50,000 a year," and management will say, "It isn't worth it."

Price tag on service

MR. MORGAN: How can Mr. Klein put a price tag on better service to customers? We have a similar situation, and I'd like to be able to price that.

MR. KLEIN: It's hard to put a tag on the customer service phase of it, but actually in our application it was a relatively simple thing to get the cost of doing it manually. We had the people in our central control office and the communications facilities between our field offices and central control, plus the people in the stations who were performing the tasks. It was a relatively simple operation to cost it out.

MR. MORGAN: That places the cost, but how do you determine the benefit?

Long and short of it

MR. KLEIN: Well, I think the benefit in the reservations phase shows up in higher load factors of greater accuracy, and simply because we don't have that period of time where, under the manual system, we were in a state of flux with the last four seats that represent profit. With those seats being available to anyone in a matter of seconds, and I mean three to seven seconds—we have a real benefit, but it is difficult to put an accurate figure on it.

MR. SPRINGER: There, again, I think this falls in the area where certain things become management responsibilities. For instance in our case, when the prospective policy holder sends in an application for automobile insurance, I think it's our job to tell management that we can produce a policy and have it in the mail tomorrow at a certain unit cost or in three days, or so forth.

MODERATOR KELLER: Speaking of management responsibilities, isn't it a fact that data processing is rather top heavy with technicians and really short of good managerial talent — an understandable fact, however, when we consider that today's data processing is merely an advancement of punch card accounting which has almost always been relegated to the supervision of a technician.

Administrator needed

MR. HASLETT: It has been my contention that the solution to a basic problem in business automation management is to have the organization responsible for getting the job done run by an administrator, not by a technician.

If you find the combination of the two, you are very, very lucky.

MR. DWYER: I think we want to be careful, though, how we define the term, technician. You've got to have the best people, technically informed, in order to make the best

You look like a man who thinks for himself—may I ask what cigarette *you* smoke?

use of your data processing. We can't blithely say: "Put the administrators in, and they're going to be able to get the best use of the equipment."

MR. HASLETT: You are 100 percent correct. However, you can have the best group of technicians in the world, but unless you have a man who knows how to tie their skills together and make them productive, they can go off in all directions.

MODERATOR KELLER: We keep getting back to management or lack of it in some degree, either top management, the management of the EDP or computer operations.

It would appear that one of our basic problems, then, is to raise the standards of data processing management. We seem to need greater emphasis on administration and less on technicians.

Divorce is granted

MR. MORGAN: I think you have to differentiate between EDP and operations. In our particular company we have divorced the operations of the computer or any other data processing work from the design. I am in the methods and procedures department.

We have nothing whatsoever to do with operating any equipment except on a test or experimental basis. Our people are familiar with various kinds of equipment. We have the programmers as far as EDP is concerned, and we also have a group of men who know nothing about the computer. At present, these men are working on communications systems such as Shell referred to.

We think that divorcement of the long range job of getting the work on the equipment from the actual operating responsibility, is basic organization. In both cases, the top man, I quite agree, should be an administrator rather than a technician, including the top operations man.

MR. SPRINGER: I think this is probably divorced in just about every company, but it's mostly a question of just how far down the line it's divorced.

The problem with people

MR. MORGAN: If there is a question implied there, I can say that our methods research and procedures department is in research and development and reports to the vice president of Research and Development. The manager of the data processing center reports to the controller.

•

In closing, there was a brief discussion on the problem of recruiting qualified systems and programming personnel, with all participants agreeing that staffing represented one of their biggest problems. Summarizing the discussion, the moderator called attention to the continued reference to "people" as the major cause of data processing problems, and the almost total lack of complaints regarding the equipment side of business automation.

There was general agreement that better training and development of operating personnel was essential to the continued progress of data processing, and that there was a definite need for better understanding, and more active participation and direction from top management. ■

new 50-station collator

Fully automatic . . . unprecedented performance without the penalty of high price or space waste!

Announcing a new dimension in collating versatility, accuracy, speed and compactness — the all-new, completely automatic Rotomatic by Thomas Collator Industries, Inc. If you collate in volume, you'll want all the details on the Rotomatic's ease of total operation and multiple savings. For complete information and prices, without obligation, write today.

- Accurately collates, counts, staggers or stitches 25,000 sheets per hour
- Exclusive push button programmer permits different jobs to be run at same time
- Occupies only 17½ sq. ft. of floor space
- Loads in less than 7 minutes . . . no adjustments for vacuum systems, fans, weights, finishes
- Handles sheet sizes from 7" x 8" to 11" x 14" in most every weight and finish
- Offers more features at a lower price than any other collator on the market

Thomas Collator Industries, Inc.

Dept.GG4, 100 Church Street, New York, New York

For More Information Circle Reader Service Card No. 12-57

An MBA Product Preview

Control Data's Large-scale 1604 Computer

Components for the 1604 system include the computer console, the 1605 Adapter, and the optional 1607 Magnetic Tape System.

A FULLY transistorized, large-scale, stored-program, general-purpose digital computer, the Model 1604, has been put into production by Control Data Corporation's Computer Division. The first production model is scheduled for delivery to the U.S. Navy Postgraduate School at Monterey, Calif.

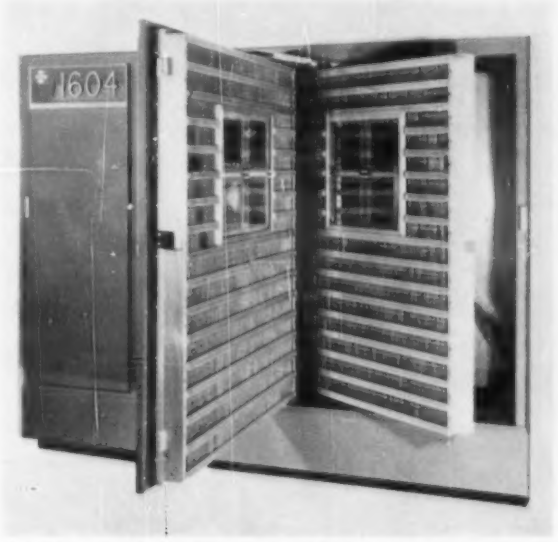
The 1604 is credited with a wide scope of uses, ranging from large volume commercial data processing and scientific problems to defense systems control. It features versatile input-output facilities and, by means of a related 1605 Adapter, is also capable of utilizing standard input-output equipment manufactured by other companies.

Another piece of optional equipment, the 1607 Magnetic Tape System, can provide up to 24 magnetic tape transports, producing tapes compatible with most existing tape components.

The computer itself is modular in construction with a high degree of circuit standardization. Transistorized printed circuit modules are used throughout. Because of this, the 1604 requires smaller installation space than comparable computers. A complete system can be installed in a room 20 by 20 feet. Room air-conditioning is recommended, but no special ducting is required.

Input-output operations in the new computer are carried out independently of the main computer program. When transmission of data is required, the main program is used only to initiate an automatic cycle which buffers data to and from the computer memory. The main program then continues while the actual buffering of data is carried out independently and automatically.

The internal memory is a large-capacity magnetic core storage system providing high-speed, non-volatile, random-access storage for 32,768 words of 48 bits each. One 48-bit word may contain either a 48-bit data word or two 24-bit instructions. Some of the special programming features include ease of handling constants, indirect addressing, four search instructions, high-speed input-output transfers, buffering, external function, program interrupt, and a large group of logical commands.



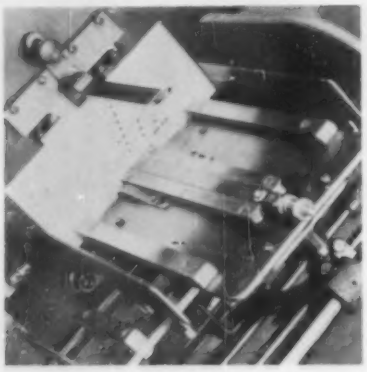
The large-scale computer provides random-access storage for 32,768 words of 48 bits each.

Use of the 1605 Adapter permits communication between the 1604 and any of the following IBM peripheral equipment: 714 Card Reader, 727 Magnetic Tape units, 717 Line Printer, and 722 Card Punch. The company reports that the 1604 is priced well below other computers of comparable performance being offered in the U.S. today. Circle No. 12-15

MBA Showcase

New Products for Business Automation

Tab Card Inserter



A tabulating card feed which can be attached to any recent inserter made by the Bell & Howell Phillipsburg Co. is now available. By using the attachment, it is possible to feed tab cards from one station on the inserter while conventional inserts such as letters, folders, reply cards and the like are being vacuum-fed by other stations. This unit permits feeding of both random-punched and end-punched cards. It incorporates a knife-edge pusher which works at the same rate of speed as the machine itself. Circle No. 12-17

Remote Dictation System

The S.I.-70 remote dictation system by Scribe Internationale features the "Miracle Mike" desk station which occupies only five by eight inches of space on the executive desk. The system also uses reusable Mylar magnetic tape as a recording medium. Any number of desk dictators can be linked to any lesser number of combination recorder-transcriber units. Each executive controls record, stop-start, reverse, play-back and error-correction from the microphone unit. Warning lights on the desk station indicate someone is on the line. Circle No. 12-3

Office Paper Cutter

Advantages of larger paper cutters are said to be included in this 1960 model "Triumph" manual cutter announced by Michael Lith Sales Corp. Available in two sizes, 14 and 18 inches, the Triumph can cut over a ream of paper in height (3½ inches) and it can cut to within one-half inch. Its main uses are in cutting office papers such as ledger-statement sheets, copy paper and others of this kind. Gauges are easy to read. Circle No. 12-12

Electric Staplers

Two new electric staplers, the Model B5E2 (shown here) and the B5E3, are offered by Bostitch, Inc. The B5E2 is designed for fully-automatic stapling of direct mail assemblies, reports, bulletins or the like. Staples are automatically driven when work is inserted against the combination back gauge and switch release. The units can handle up to 36 sheets of 16-lb. bond or mimeo paper with no adjustment necessary. The stapling position is always visible for exact placement of staples. The B5E3 is semi-automatic, operated by foot or knee action. Circle No. 12-2

Sequential Card Camera

The Compos-O-Line sequential card camera has been unveiled by Lithoid Inc. Designed for automatic transferral of original source data from accounting cards to film or paper ready for reproduction, the new camera produces a photographic negative of the information arranged in galley, list or tabulated form as desired—ready for making offset plates. It can also produce a positive or negative image on sensitized paper for other reproduction processes. The machine requires only five by two feet of floor space. Circle No. 12-4

Modular Clerical Work Centers

Modular clerical work centers, built around paper work conveyor units that eliminate costly steps and waste motion, are being devised by Alden Systems Co. The centers are designed to organize clerical procedures into progressive flow lines, providing for more efficient supervision and scheduling of work assignments as well as more comfort for the workers. The conveyor units, which can be installed in a variety of positions, have a track for each clerical position and a common return track. They can be expanded as the number of work stations expand. Each work center also has its own power channel. Each five-foot module has eight electrical outlets, four above top and four below. Sockets can be added for telephone jacks and other special-purpose equipment. Circle No. 12-19

Sorter Rack-Stand

A new, all-steel sorter rack and stand, designed specifically for vertical processing of tab cards, has been introduced by Diebold, Inc. The rack holds 14 vertical processing trays, one feed and 13 receiving, while the stand provides storage for empty trays. The units can be positioned directly behind the sorter for easy operator access. Four different installation choices are possible, making it simpler for the user to facilitate his own requirements. Circle No. 12-1

Paper Shredder

A new paper shredder with a capacity of 400 lbs. of newspaper stock per hour, that can be adjusted to deliver three different shred widths, is now available from Industrial Shredder & Cutter Co. The unit serves a dual purpose of destroying confidential office papers quickly while converting large quantities of waste paper to packing material. The shredder is only 25 inches wide and 28 inches long. Circle No. 12-8

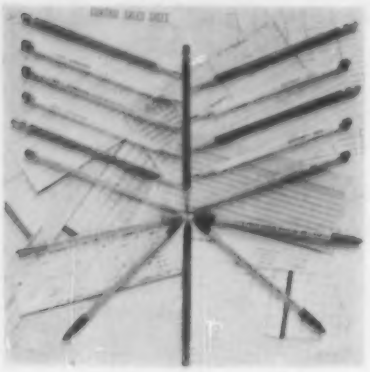
Handprinter

The Weber Marking Systems handprinter has been redesigned with a high-impact plastic handle to increase shock resistance when in use. The handprinter is used with a stencil for multiple carton shipment addressing, multiple carton marking of product and content identification, multiple label and tag marking or addressing, and reproducing data on forms, envelopes and on notices. It will print on smooth, rough, flat, and curved surfaces such as paper, cardboard or wood. Circle No. 12-14

Automated Files

The Conserv-a-matic, introduced by Supreme Steel Equipment Co. at the National Business Show, operates electrically and automatically, facilitating sit-down filing. A push of a button brings any one of 16 shelves in the single unit to within the reach of a seated file clerk. Each unit contains the equivalent of five conventional 4-drawer files. Larger installations have a chair on a built-in track. Circle No. 12-18

Writing Instruments



A specialized line of writing instruments, including both ball pens and pencils, have been developed for office automation use by Eberhard Faber Pencil Co. The line includes units for copying processes such as diazo, photocopy, facsimile, Verifax, Thermofax, and Xerography. Others can be used for non-reproducing processes — electronic test-scoring and mark-sensing. For the latter, one pencil is available which makes a mark that can be "read" by a mark-sensing machine, while another pencil for notations on the copy, leaves no mark visible to the electronic machine. There are 11 different ball pens and pencils available. Circle No. 12-9

Color-Coded Control Panel Wiring System

GC PanelLOGIC has been announced as a new approach to panel wiring by its manufacturer, Clarkson Press, Inc. The system contains all of the tools and materials needed for any type of board wiring. It is available in a portable kit which contains 10 color-coded wire spools or as individual materials.

Wires are cut the exact lengths, providing for neater, more compact boards. The different wire colors facilitate easy tracing of wires for checking and testing circuits through terminal posts without removing them from the panel.

Split wiring flexibility with 2, 3, 4, or 5-way color-coded split wires in any length can be made.

The kit contains, beside 10 spools of 200-foot colored wire, 2,000 jack-type and/or self-contacting type terminals and 200 longer terminals, a tool for wrapping wires, a tool for seating terminals and unwrapping wires, and a pair of wire-cutting and stripping pliers. Circle No. 12-5

Small Scientific Computer Shown

A small, transistorized, scientific computer which is capable of performing more than 100,000 calculations a minute, has been announced by International Business Machines Corp.

The system, which requires little more space than the average desk or drafting table, is composed of two modular components, a central processing unit and a paper tape reader and punch. It performs arithmetic, logical and input-output operations on a production basis.

The central processing unit consists of an operator's control console, a modified electric typewriter, magnetic core storage unit, arithmetic and logical unit and related circuitry. Input device is the IBM 1621 paper tape reader and/or the typewriter. Output devices are the IBM 961 tape punch and the typewriter.

The computer has been designed for complex engineering and scientific computations on a continuous or production basis. It has a 20,000-digit core memory, high-speed operation and utilizes advanced programming systems such as FORTRAN and Symbolic Program System. Circle No. 12-16

Rem Rand Develops 'Larc' Large-Scale Computer

What Remington Rand Univac Division termed the world's fastest and most advanced large-scale "solid state" computer system is now available for business and scientific use.

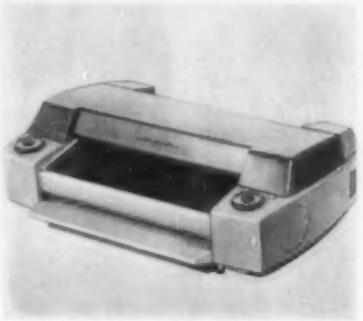
The new system, said to operate from 25 to 200 times faster than any computer in existence, can perform 250,000 additions and subtractions of 12-digit decimal numbers per second. It will sell at upwards of six million dollars and will rent from $135,000 a month.

The Larc can perform data processing and scientific problems concurrently. The company gives as an example a payroll and labor distribution preparation for 15,000 employes in a total computer time of 15 hours per month. At the same time, it can simultaneously solve scientific problems in 93.5 percent of this running time.

As an example of its capacity, the magnetic core units store up to 97,500 words, while the high-speed drums store up to 6 million words. These are supplemented by an enormous storage capacity of up to 40 magnetic tape servos.

The system consists of a main computer which works in conjunction with a second computer called the processor, eight core memory units, 12 drum files, four tape units, and operator and engineer consoles. Circle No. 12-20

Small Diazo Copier



A desk-top size, all-purpose copying machine employing the semi-moist diazo process has been announced by Copymation, Inc. The "Dart" is designed to expedite office and plant system procedures economically. It reproduces same-size copies up to 13 or 18 inch widths in any length. The "Dart" includes a bonus photocopying feature in a second lamp for exposing standard photocopy papers. With the use of an accessory processor, the unit can double as a photocopy machine. The "Dart" has an 800 watt lamp and plugs into any standard outlet. Circle No. 12-10

Clary Introduces Low-cost Computer

A simple to operate, general purpose, direct-entry computer, built to sell for $18,000, has been announced by the Clary Corp. The DE-60 is said to be so simple to operate and program that a high school student could learn the job within a day. Applications suggested include depreciation and amortization schedules, actuarial calculations, interest, and payment rates and many others. Program simplicity permits the DE-60 to be prepared in minutes to handle these tasks, and the computer can be occupied on different jobs throughout the day. No special cooling is needed. Circle No. 12-24

Computer Output Reader

A high-speed recording system that "reads" the magnetic tapes from electronic computers and instantly records characters on microfilm has been announced by the Eastman Kodak Co. Called Dacom for Datascope Computer Output Microfilmer, the system is designed to cope with the high output of computer data—frequently put on magnetic tape for storage until it can be decoded. The Kodak system "reads" the tape and displays the corresponding letters or numbers on the face of a cathode ray tube. A special camera continuously photographs the face of the "TV-like" tube to put a complete page on microfilm. Dacom has a speed of 16,500 characters per second which means that it can record 6,900 lines a minute. A roll of 16mm film will contain the decoded information from more than 35 reels of 2,400-foot magnetic tape. Circle No. 12-21

NEWS

'Business Bowl' Game Ends in Tie

The five-man team from Pennsylvania State huddles to plan their strategy in the "first quarter" of the "Business Decision Game."

A new form of collegiate competition, requiring all brains and no brawn, made its debut last month as 45 graduate students from nine leading universities matched their skills in a "Business Decision Game."

The five-man teams competed in the art of business management, condensing six years of business operation into 13 hours in an attempt to make their theoretical companies emerge with the best profit picture.

Scoreboard for the games was an electronic computer which simulated the economics of the selected industry and interpreted the team's decisions while preparing quarterly statements for each "company" showing its over-all business standing.

The games, which were held November 13-14, at the IBM Educational Center in Chicago, brought together representatives from Northwestern, Chicago, Illinois, Wisconsin, Michigan, Ohio State, Pennsylvania State, Oklahoma State and Washington (St. Louis).

The teams from Penn State and Illinois won a first place tie, having guided their companies to substantial profits and provided their stockholders with large dividends in the six years of mythical operation.

Two professors from each school served as referees for the games, judging the winners on the basis of the soundest business condition existing at the conclusion of play.

According to Warren C. Hume, IBM's midwestern regional manager, the games acquaint more college students and faculties with the latest techniques in scientific management.

Smith-Corona Marchant Establishes Data Division

Smith-Corona Marchant has announced establishment of a Data Processing System Division, and has elected David S. McNally as vice president of the corporation and general manager of the new division.

Western Union Constructs Transcontinental Beam

Western Union will construct a high capacity communication systeam for the U.S. Air Force which will make necessary a microwave beam network from coast-to-coast.

The new transcontinental leased wire system will be one of the largest Western Union has ever provided, and in addition to the Air Force broad-band data facilities, 12,000 telegraph circuits will be opened simultaneously for Western Union's own expanding requirements.

The new beam system will provide Western Union with vastly augmented facilities for utilization in leasing other private wire and data processing systems, for telegraph message, facsimile and other new company services.

This will be one of the largest single microwave construction projects ever undertaken.

New Elliot President

J. D. Kingery

James D. Kingery has been named president and a director of the Elliot Addressing Machine Co. Mr. Kingery was formerly vice president of Bell & Howell Co. and president of its subsidiary, Phillipsburg Co.

National Data Processing Sells to Chance Vought

National Data Processing Corp., Dallas manufacturer of data processing equipment has sold a majority interest in the firm to Chance Vought Aircraft, Inc.

NDP, which was recently awarded a contract by the Federal Reserve Banks to develop equipment required to automatically sort and process checks by means of magnetic ink character recognition, is also presently manufacturing the Readatron credit card system for processing retail credit invoices.

Cue Elects in Boston

Users of the Burroughs 220 electronic data processing system have formed an organization to be known as CUE—Cooperating Users' Exchange.

At a recent organizational meeting in Boston, delegates elected the following officers:

President, Robert M. Gordon, Stanford University; Vice-President, Richard C. Lesser, Cornell University; Secretary, Merle D. Courson, First National Bank of San Jose.

Schram New President Of Comptometer Corp.

J. A. Schram

With the official resignation of A. E. Carlson, it was announced recently that J. A. Schram has been elected as president of Comptometer Corp.

Mr. Schram has been director of Comptometer and head of the firm's Burke Golf Division since it was acquired in May of this year.

Mr. Carlson, who became president in 1956, announced he had to curtail his activities to less than full-time because of health reasons.

Over 1,000 Attend Controllers Institute Conference

The 28th Annual National Conference of the Controllers Institute of America attracted over 1,000 members and guests in Pittsburgh. Pictured at the annual banquet meeting are, left to right, R. Burt Gookin, vice president-finance, H. J. Heinz Co., general chairman of the conference; Roger A. Yoder, vice president-finance, Detroit Steel Co., Institute president; and seated at the far right, James L. Peirce, vice president and controller of the A. B. Dick Co., who was 1957-58 Institute president.

Recent Appointments

WILSON JONES CO.—Jack Linsky of New York City has been elected a director, chairman of the board and president of Wilson Jones, manufacturers of loose leaf forms, equipment and supplies. He succeeds Benjamin Kulp, who retired. Linsky is also president of Swingline, Inc. stapling machine and staple manufacturers, and largest stockholders of Wilson Jones.

GENERAL TIME CORP. — John F. Carr has been elected a vice president of General Time Corp. He continues as general manager of the company's Stromberg division in Thomaston, Conn., manufacturers of control devices and developers for electronic data gathering and communication.

AMERICAN BUSINESS SYSTEMS, INC. —Former New Jersey Branch Manager of ABS, Seymour Citron was elected vice president in charge of sales.

FARRINGTON MANUFACTURING CO. —H. W. Tripp, financial vice president of the University of Rochester, New York, was elected a director of Farrington Mfg. Co. at their stockholders meeting.

BOOZ, ALLEN & HAMILTON—Neal J. Dean, previously technical director of Booz, Allen & Hamilton's Electronic Data Processing Department, has been admitted to the partnership of this nationwide management consultants firm.

BROADVIEW RESEARCH CORPORATION —The appointment of Thomas W. Wilder III as director of data systems research at Broadview Research Corp. has been announced.

SMITH-CORONA MARCHANT — Election of David S. McNally as a vice president and general manager of a newly formed data processing systems division, has been announced by Smith Corona Marchant.

BENDIX CORPORATION—Bendix Aviation Corp. announced the election of R. C. Fuller, general manager of its Pacific Division, as vice president and group executive of the corporation and as a member of the corporation's administrative committee.

MBA Reviews

Handbook of Automation Computation and Control, Vol. II.

Grabbe, Ramo and Wooldridge, Published by John Wiley & Sons, Inc. New York, N.Y. $17.50.

Volume 2 of the authors Handbook is devoted to Computers and Data Processing. Its 31 chapters contain the works of some 40 contributors and the contents cover Computer Terminology, Digital Computer Programming, The Use of Digital Computers and Data Processing, Design of Digital Computers, Design and Application of Analog Computers, and Unusual Computer Systems.

As the authors acknowledge in the preface, "the Handbook assumes some engineering training and will serve as an information source and refresher for practicing engineers." Management and others interested in the subjects covered will undoubtedly benefit from the contents of Volume 2, despite the rather technical presentation.

Managing by Communication.

By Willard V. Merrihue, manager of Community and Business Relations, General Electric Co. To be published in January, 1960 by McGraw-Hill. $7.

How to use the modern concept of communication to manage more successfully is the basis for this newly published book. The author provides examples of proved communication techniques and principles that should enable management men to gain greater understanding and cooperation from employes—desired action from higher management—and make their personal leadership more resultful.

The book draws liberally on the practices and policies of GE, noted for its forthright communication to employes and the public. It explains advanced concepts such as the use of modern marketing techniques in developing a positive program of employe relations and the famed General Electric Communication Round Tables.

Business Experience with Electronic Computers.

By B. Conway, J. Gibbons and D. E. Watts. Published by Controllers Institute Research Foundation, New York. $5.

This 191 page research study and report—"a synthesis of what has been learned from electronic data processing installations"—was prepared for the institute by three directors of Management Advisory Services of Price Waterhouse and Co. It is based on a survey of 17 leading companies, all of which are in the "giant" classification.

The report indicates that, while the electronic computer has not performed the "miracle" of reducing clerical overhead and complete solution of all management problems, it is performing well as a business tool—though in a less glamorous way.

The report reveals considerable modification of original management expectations. For one thing, it is acknowledged that a substantial clerical force is required to feed the machines so they can operate on a scale which justifies their operation. Also, the decisions that the machines can make are of a simple, semiclerical variety.

Among other significant revelations, the report finds that the "building block" approach has undergone considerable deflation. The authors conclude that it is better to start with the essentially complete machine and a first-shift operation, and to "build" by adding second and third shifts with their substantially lower rates and with rental based on hours worked.

While one may not agree with all or any of the conclusions expressed in the report, everyone will benefit by exposure to the opinions that the authors frankly admit are not offered with "authoritative finality" which neither they nor anyone else can claim.

On Request

The following booklets, catalogs and brochures are considered of interest to readers of MANAGEMENT and BUSINESS AUTOMATION. Copies can be obtained by using the convenient Reader Service Card and circling the corresponding key numbers.

The Act I Compiler—a new Royal McBee programming system, is designed to make the programmer's job as painless as possible when working with the LGP 30. The compiler is fed into the memory on punched tape and translates problems to the machine language automatically. Eighteen pages of complete explanation. Circle No. 12-25

Alphanumeric Typewriter—used in conjunction with the Bendix G-15 Digital Computer is completely described in a one-page data sheet now available. Circle No. 12-26

Univac Narrator—17 pages, illustrated description of order processing, inventory control and sales analysis application of the Univac File-Computer System for the Associated Grocers Cooperative of Phoenix and Tucson, Arizona. From Remington Rand. Circle No. 12-27

FR-400 Digital Magnetic Tape Handler—described and illustrated in an 8-page brochure by Ampex Corp. Booklet includes complete specifications. Circle No. 12-28

Paper Drilling Machines—a 20-page catalog by Challenge Machinery describes company's complete line of machines and accessories, including specifications. Circle No. 12-29

Engineering Drawing Reproduction Films—described in a 4-page folder from Di-Noc Chemical Arts, Inc. Folder presents technical and processing information as well as available sizes and prices. Circle No. 12-30

Integrated and Electronic Data Processing—covered in a new booklet from National Cash Register Co. The booklet describes NCR equipment designed to simplify office automation. Circle No. 12-31

MBA's Calendar

December 3-5—Third annual International Visual Communications Congress, sponsored by the Society of Reproduction Engineers. Statler Hilton Hotel, New York City.

December 16-18—AMA Workshop Seminar in New York on Electronic Data Processing, analyzing operations for the application of EDP. For details write American Management Association, Inc., 1515 Broadway, New York 35, N.Y.

December 26-31—American Association for the Advancement of Science. The 126th annual meeting at the Morrison Hotel, Chicago. Write Dr. R. L. Taylor, AAAS, 1515 Massachusetts Ave., N.W., Washington, D.C.

January 31-Feb. 5—American Institute of Electrical Engineers 1960 Winter General Meeting in New York.

February 1-3—AMA Workshop Seminar in New York. Installing and administering electronic data processing systems. Write American Management Association, 1515 Broadway, New York 36, N.Y.

March 21-24—IRE National Convention. In the Coliseum and Waldorf Astoria Hotel, New York City.

March 23-25—Career Management Conference Clinic sponsored by the National Machine Accountants Association, Chicago, Conrad Hilton Hotel. Contact Ken Iles, P.O. Box 1620, Chicago 90.

April 18-19—Third Annual Conference on Automatic Techniques, Cleveland-Sheraton Hotel, Cleveland, Ohio. Jointly sponsored by the ASME, AIEE and IRE. Write J. H. McRainey, Room 530, 1213 W. 3rd St., Cleveland 13, Ohio.

May 2-6—The 1960 Western Joint Computer Conference, San Francisco, Calif.

May 22-27—41st International Conference and Annual Exposition of the National Office Management Association. Queen Elizabeth Hotel, Show Mart, Montreal, Canada.

TABULATING CARD GUIDES

FOR

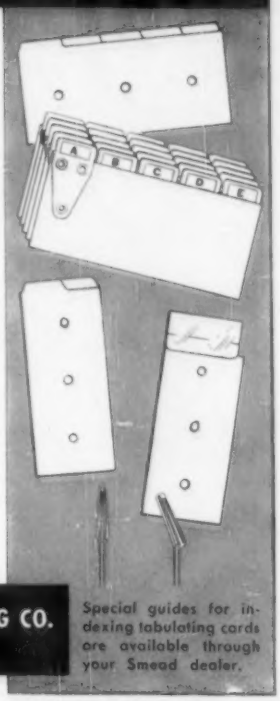
AUTOMATED SYSTEMS

We manufacture a wide line of Tabulating Card Guides in plain, flat, double insertable celluloid, metal and flat angled insertable celluloid tabs.

Card Guides available in Pressboard or Vulcanized Fibre stock.

SEE YOUR *Smead* DEALER

WRITE FOR BROCHURE NO. TA-2



SMEAD MANUFACTURING CO.
HASTINGS, MINN.

Special guides for indexing tabulating cards are available through your Smead dealer.

For More Information Circle Reader Service Card No. 12-58

ADVERTISERS' INDEX—DECEMBER 1959

American Cancer Society 6

C. L. Barkley & Co. 6
Agency—Frank C. Jacobi, Chicago

Davidson Corp. 5
Agency—Hazard Advertising Co., Inc., New York City

Farrington Mfg. Co. . . . . . **2nd Cover**
N. W. Ayer & Son, Inc., Philadelphia

Haloid Xerox Inc. . . . . . **3rd Cover**
Hutchins Advertising Co., Inc., Rochester, N.Y.

Management and Business Automation . . 7

The Mosler Safe Co. 3
Cunningham & Walsh, Inc., New York City

Royal-McBee Corporation . . . . . **4th Cover**
C. J. La Roche and Company, New York City

Smead Mfg. Co. 45

Thomas Collators Inc. 36
Douglas Turner, Inc., Newark, N.J.

EDITORIAL

A Matter Of Ethics

The ethics of equipment representatives was one of the interesting points raised at the recent MBA round-table discussion on data processing problems, which is reported elsewhere in this issue. Specifically questioned was the practice of "overselling" equipment capacities, capabilities and potentials in a hard sell attempt to procure the initial order, knowing full well that before a year was up much additional equipment would be necessary to obtain the desired results.

The approach is not new, having been used to a considerable degree by many business equipment salesmen. Unfortunately, the practice seems to have grown in popularity, with the question of ethics all but trampled underfoot in the race for a customer's order.

Of course, anything that is "sold" also has to be "bought". This puts the shoe on the other foot, meaning that management can rarely escape the final responsibility for being oversold. The man who signs the contract should base his decision on more than just enthusiasm. He should review the results of an authoritative systems analysis and be convinced the costs and other factors indicated are substantially correct.

There is simply no substitute for solid systems planning and whenever a good analysis has preceded the installation of equipment there have never been any complaints regarding the outcome. In our opinion, most of the "sour grape" attitudes on data processing have come from those trying to cover the tracks of an inept systems study. This involves a question of ethics in still another field.

But, regardless of how it has been sold, or bought, the results of data processing to date have generally been excellent. While we agree that the equipment manufacturers could do with a little more "factual" selling, we also feel that the buying representatives of management have an obligation to minutely separate fact from fiction before recommending any installation to their organization. And if they demand facts, they'll get them—for today's competitive situation makes it so.

How to make 'Impossible' Deadlines:

20 Copies of a 500-Page Report...in 3 Hours!

PUSH THE BUTTON
and copies flow!

It isn't often that anyone wants 20 copies of a 500-page report.

But a client of a Pittsburgh engineering firm did. Moreover, he wanted them in a hurry.

A few years ago, meeting the deadline he set would have been impossible. Besides, the cost would have been prohibitive.

Today neither is true, thanks to *automatic* xerography. By means of a XeroX® Copyflo® 11 continuous printer and offset duplicating, running off 20 copies of a 500-page report would be amazingly simple . . . *the work of a single morning.*

A Copyflo 11 continuous printer prepares offset paper masters, at the rate of 20 linear feet a minute, on a continuous roll 2,000 feet long and 11 inches wide. The roll is cut into individual masters, which are then mounted on offset duplicators for runoff of multiple copies.

Copyflo printers also copy onto plain, unsensitized paper or translucent vellum for diazo-type reproduction. They enlarge, reduce, or copy size to size, offering the speediest, most flexible, most economical way to get copies precisely like the originals from opaque documents of all kinds or from microfilm.

You, too, can make "impossible" deadlines with a Copyflo printer. Just push the button . . . and copies flow!

For complete information write Haloid Xerox Inc., 59-184X Haloid St., Rochester 3, N. Y. Branch offices in principal U. S. and Canadian cities. Overseas: Rank-Xerox Ltd., London.

HALOID XEROX®

For More Information Circle Reader Service Card No. 12-59

The simple truth about Data Processing

To get the on-time information they require, many executives visualize the need for a battery of expensive equipment. Yet there is a low-cost system that fits your company as it stands and as it grows.

To a great many businessmen today, data processing is somewhat suspect. On the one hand, there's general agreement on the *need* for office automation—but, on the other, there's the fear that the data processing equipment required to bring it about will alter their procedures, their people, their profits.

Then, too, there's the *expense* of that equipment. And the often considerable gamble that the large investment called for won't ultimately pay off in results.

Much of this feeling about data processing, of course, is justified. Most available systems *are* large and unwieldy. More than that, they're complicated. Special personnel must be found to run them. Your own people must be thoroughly trained. And, as for your methods of doing business—even *they* must often be altered to the machines.

Among all of today's data processing systems, there is only one which does not impose these burdens.

That system is Automatic Keysort. Easy to use, remarkably low in cost, Automatic Keysort is the *servant* of your business and your people—never their master.

Reason? Only Automatic Keysort utilizes marginally-notched *original records* for quick, easy sorting and classification. Only Automatic Keysort gives you automatic coding and tabulation with *one* low-cost machine! Only Automatic Keysort is designed to adapt to *your* way of doing business.

Result: with Automatic Keysort you get the management reports you want *when you want them*. Without specialized personnel. Without disrupting your procedures. And at a cost that will truly surprise you.

Your nearby Royal McBee Data Processing Representative will be happy to tell you more about Automatic Keysort as it relates to *your* business—whatever it may be. Call him, or write Royal McBee Corporation, Data Processing Division, Port Chester, New York for brochure S-500.

ROYAL McBEE · *data processing division*

NEW CONCEPTS IN PRACTICAL OFFICE AUTOMATION

For More Information Circle Reader Service Card No. 12-60